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ABSTRACT

Part of an articulated curriculum for grades K-12, this fifth grade resource unit, the first in a series of regional studies, provides an overview to the study of geography of the U. S. Program descriptions, course objectives, teaching strategies, and an explanation of format are presented in the teacher's guide, ED 062 226. Students, emulating the skills of the geographer, examine and compare a series of map patterns in the United States and work out a system of four regions according to selected criteria. Then, in the subsequent units, pupils focus on case studies rather than on a detailed study of each region. Emphasis is upon students developing map skills and, further, upon drawing inferences from a comparison of different map patterns. Activity units are suggestive rather than prescriptive, and the teacher is encouraged to add other activities and materials and to consider the ability, previous experience, and interests of the class. Related documents are ED 061 134, ED 062 227, and SO 002 732 through SO 002 741. (Author/SJM)

ED 069564

Grade five
Unit: The United States: An Overview

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RESOURCE UNIT

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INTRODUCTION TO UNIT

This unit serves as an overview to the study of the geography of the United States. More specifically, it provides a view of the United States as a whole before pupils study the case studies showing sequent occupance in individual cities or the regions in which these cities are located. The overview also helps pupils understand the concept of regionalization.

This is a resource unit. The teacher should not attempt to teach all of the suggested activities. Hopefully, she will add other activities and materials to those suggested. As she selects activities and builds a teaching unit from this resource unit, she should consider such factors as the following:

- (1) The general ability level of the class. (If the class is below average in ability, the teacher may wish to omit all of part three as well as some of the more difficult activities designed to teach other sections of the unit.)
- (2) The differing abilities and interests of class members. (This criterion is particularly important in selecting some of the individual activities or in deciding how to group the class for particular activities and for needed review exercises.)
- (3) Previous experiences of pupils in the class. (The selection of activities will depend in part upon (a) previous experiences of pupils outside of school, including their travel experiences or where they have lived in earlier years and (b) earlier school experiences. Particularly important here is whether or not pupils have studied the earlier courses prepared by the Curriculum Center at the University of Minnesota. The Center's Kindergarten course focuses upon geography, and each of the first four grades teaches many geographic concepts and generalizations about the communities studied or the places where the different families studied live. Indeed, these communities and families have been chosen in part to illustrate different kinds of site concepts. The activities in this resource unit frequently indicate that some idea is to be reviewed if pupils have "come" through the earlier courses. If the children have not studied the ideas earlier, the teacher should probably use some of the optional activities designed to teach the concepts or generalizations. If they have studied the earlier courses, the teacher will want to ask questions designed to get pupils to apply previously-learned concepts and generalizations to the new data. To help the teacher identify ideas which are reviewed and those which are introduced for the first

time, new generalizations and concepts are starred in the list of objectives.

If pupils have come through the earlier courses in the Center's curriculum, this overview can be taught quickly. However it will take longer if many of the ideas must be introduced for the first time.

- (4) Materials available for the course. (Some procedures will have to be omitted if needed materials are not available or if others cannot be substituted. Many substitutes can be found in texts and maps and audio-visual materials already available in a school system. It is impossible to mention all sources for maps or pictures in the materials section of this resource unit. The teacher can also add to materials as the year progresses and so be able to teach more of the activities a second year.)
- (5) Community resources available. (Some communities have useful museums with many exhibits to teach some of the concepts suggested in this overview or with useful exhibits of globes and maps. Some also have a number of people who can serve as resource people about different parts of the country or who have slides or movies which they may be willing to loan to the school. Moreover, the teacher should consider working through the school principal and PTA in a drive to collect old magazines such as National Geographic and Arizona Highways for use in the classroom.)
- (6) The need for variety in procedures. (Variety is needed both for the sake of maintaining interest and to achieve the different goals for the unit. Since teachers are expected to add activities and choose from among those in this unit, they must make sure that they provide for variety without interrupting the flow of the unit. When the teacher omits three or four of the activities in the present unit, she may also be omitting the suggestions built into the activities to help pupils understand the flow of the unit; if so, she must build in her own transitions from one activity to another.)

The format of this resource unit is designed to help teachers see the relationships between objectives, content, teaching procedures, and materials. The first column on objectives indicates why an activity should be taught and helps the teacher focus the activity. The second column indicates the content which is to be used to achieve the objective. The third column suggest the activity which might be used to teach the content and achieve the objectives, and the fourth column suggest materials

which can be used to handle the procedure. If no objective appears in column one opposite an activity, the teacher should look up the column to the last objectives indicated for any one procedure. Objectives are not repeated from one activity to another until different objectives intervene. The bibliography at the end of the unit provides more complete bibliographical data than can be included within the body of the unit.

OBJECTIVES

This unit should make progress toward developing the following objectives:*

CONCEPTS

1. Globalism: rotation of earth, inclination of earth, revolution of earth around sun; seasons, ocean currents,* prevailing winds.*
2. Location:
 - a. Position: longitude, latitude, high latitudes,* middle latitudes,* low latitudes,* meridian, parallels.
 - b. Situation: distance, direction, relationships.
 - c. Site: elevation; landforms (plains, hills, mountains, plateaus, valley, gorge, mesa, butte); water (river, drainage,* evaporation,* precipitation, hydrological cycle*); climate (temperature, growing season, seasonal variations, precipitation); soil (types,

erosion); vegetation (coniferous and deciduous forests, tall grasslands, short grasslands, desert, tundra).

3. Cultural use of environment: political boundary, population density, agricultural types, predominant economy,* urbanization, industrial development.
4. Diversity-variability: patterns;* region.*
5. Change: physical, biotic,* man-made.
6. Interrelatedness: areal association;* trade.

GENERALIZATIONS

1. Every place has three types of location: position, situation, and site.

*Introduced for first time in this curriculum. Others are reviewed from earlier courses, with activities designed to increase depth of understanding.

- a. Places can be located in terms of their situation; situation describes a phenomenon in areal relationship with other phenomena with which it is associated, including distance and direction from such phenomena.
 - b. Things can be located at specific points on the earth's surface, usually designated by an abstract grid and described in terms of latitude and longitude.
 - c. Places can be located in terms of site which relates a phenomenon to the detailed physical setting of the area it occupies.
2. Phenomena are distributed unequally over the earth's surface, resulting in great diversity or variability from one place to another. No two places are exactly alike.
- *a. Unevenly-distributed phenomena form distinctive patterns on the map.
- *3. Temperature is affected by such factors as distance from the equator, elevation, distance from warm water bodies, prevailing winds, and physical features which block winds from certain directions.
- a. Temperature and seasonal differences are affected in part by distance from the equator; temperature ranges
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time in the curriculum. The others are reviewed. If part
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are smaller near the equator than
further away from it.

- b. Temperature is affected in part by
elevation; air is cooler at higher
elevations than at lower elevations
if latitude and distance from the
sea are the same.

- *v. Places in the interior of continents
tend to have greater extremes of
temperature than places along the
coast.

- 1) The ocean and other large bodies
of water do not heat up so rapidly
as land nor cool so rapidly as
land.

- *2) Winds which blow over warm bodies
of water (or land areas) carry
warm air to nearby land areas.

- *4. Precipitation is affected by factors such
as distance from bodies of warm water,
wind direction, temperature, ocean cur-
rents, and physical features which force
winds to rise.

- *a. Warm air can hold more water than cool
air; therefore warm air picks up mois-
ture and the cooling of air leads to
precipitation.

- *b. Winds which have been warmed and have

1. ... picked up moisture crossing large bodies of warm water tend to cool as they rise over mountains and so drop their water on the side of the mountain from which they come.
 - *c. As winds descend into valleys from mountain ridges, they are warmed and tend to pick up moisture.
 - *d. Winds which cross cold water currents are cooled and will pick up moisture rather than dropping it as they cross land areas which are warmer than the water.
- *5. The amount of moisture needed for vegetation and crops is affected by the time of year when the area receives most of its moisture and by the temperature of an area.
 - *a. The time of year when an area receives its precipitation is important to agriculture. If it comes during the growing season, it makes it easier to grow crops; however, if it comes mainly at the hottest time of the year, more is needed than during cool months to provide an equal amount of moisture.
 - *b. The land in hot regions dries fast as the warm air picks up moisture; therefore more rain is needed to grow crops in these regions than in regions which are not so hot.
- *6. Water is evaporated from the surface of the ocean and on land are then evaporated by way of rivers and lakes to the ocean.
 - a. Rivers flow from higher to lower elevations.
 - *b. If lakes are present, they are likely to evaporate water from the lakes on the surface.
7. The rotation of the earth and the tilt of the axis around the sun upon climate.
 - a. The rotation of the earth causes the day and night of the earth and the sun's rays fall on different parts of the surface.
 - *b. The direction of the wind is caused by the rotation of the earth.
 - *1) Difference in temperature leads to wind. As wind blows from high pressure to low pressure, it causes the air to move in to the low pressure area.
 - *c. The ocean is affected by the direction of the wind and the rotation of the earth.

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*6. Water is evaporated from the ocean, is carried in clouds by the wind, is dropped on land areas through precipitation, and is then evaporated once more or runs off by way of rivers and underground streams to the oceans.

a. Rivers flow from higher elevations to lower elevations.

*b. If lakes have no outlets, they are likely to develop into salt-water lakes or dry up into salt beds.

7. The rotation and inclination of the earth and the revolution of the earth around the sun have a number of effects upon climate.

a. The rotation of the earth produces day and night, while the inclination of the earth and its revolution around the sun result in seasons and differences in temperature on the earth's surface.

*b. The direction of prevailing winds is caused both directly and indirectly by the rotation of the earth and its revolution around the sun.

*1) Differences in air temperature lead to movements of air and winds. As warm air rises, cooler air moves in to replace it.

*c. The ocean currents are caused largely by the direction of prevailing winds and the rotation of the earth.

8. Vegetation is affected by temperature, precipitation, and soil.
 - a. Trees need more water than long grasses in order to grow; long grasses need more water than shorter grasses.
 - b. Grass will grow in some areas which are too cold for trees to grow.
 - c. Deserts have very little rain and precipitation is very irregular from one year to another.
 - *d. Differing crops need differing amounts of rainfall and differing temperatures and number of frostfree days in order to grow; they need water and dryness at different times during their period of growth.
 - e. Vegetation and what can be grown is affected in part by soil.
- *9. Soil in a particular place is affected by the type of basic rock in the region, the climate, vegetation, erosion, wind, glaciers, and rivers which move soil, as well as by how man treats the soil.
 - *a. Erosion of soil results from water and wind; it is more likely in areas where grass and trees have been removed.

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*10. Nature changes the face of the earth through physical and biotic processes.

a. A river which moves rapidly carries with it much sediment and frequently cuts deep valleys.

*b. A river which moves slowly across a plain drops gravel and sand that it has moved from higher areas.

c. See 9 above.

11. Man uses his physical environment in terms of his cultural values, perceptions, and level of technology.

a. Man changes the character of the earth.

b. Machinery and power make possible greater production per person.

*c. Political boundaries are man-made and frequently do not follow any natural physical boundaries.

*12. Population is distributed unevenly over the earth's surface; many of the land areas are thinly populated.

*a. Men carry on more activities on plains than in hills and more in hills than in mountains except in the low latitudes.

- *b. Moist areas tend to have a higher population density than dry areas. However, population distribution reflects man's values and his technology as well as physical features of an area.
 - c. Large cities are characterized by a large number of people per square mile.
 - *d. A number of factors -- climate, surface features, natural resources, accessibility, and history -- affect settlement patterns.
13. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, people's skills, etc.
- *a. The value of land tends to be related to a number of factors such as moisture, soil, temperature, and growing season, population density, and transportation facilities.
 - *b. Power for industry is obtained from the use of coal, oil, natural gas, water, and nuclear energy.
 - *c. Forests can be used to obtain lumber and other timber products such as paper, turpentine, nuts, etc., depending upon the kinds of trees in the forest.
14. People in most communities depend upon each other for goods and services.
- *15. A region is homogeneous if its boundaries are drawn by human activities. If the boundaries are drawn by nature, the region is transitional.
- *a. Regions are defined on the basis of human activities. They are based upon the degree of homogeneity of the phenomena which they contain. They are based upon the basis of human activities.
- *16. Geographers study the spatial distribution of phenomena. They generalize about the spatial distribution of phenomena.
- *a. Geographers study the spatial distribution of phenomena. They generalize about the spatial distribution of phenomena.
- *17. All maps con-
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- has both advantages and disadvantages depending upon the purpose of the map.

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14. People in most societies of the world depend upon people who live in other communities, regions, and countries for goods and services and for markets for their goods.

*15. A region is an area of one or more homogenous features. The core area is highly homogeneous, but there are transitional zones where boundaries are drawn between different regions.

*a. Regions are delimited on many different bases, depending upon the purpose of the study. Some are delimited on the basis of a single phenomenon, some on the basis of multiple phenomena, and some on the basis of functional relationships.

*16. Geographers seek information about areas on the earth's surface which enables them to compare, synthesize, and generalize about these areas.

*a. Geographers ask different questions about places, depending upon their purposes at the moment.

*17. All maps contain distortions of one kind or another; each kind of map projection has both advantages and disadvantages, depending upon one's purpose in using a map.

18. Maps make it possible to discern patterns and relationships among a vast amount of data.

*d.

SKILLS

*e.

The broad skill toward which teaching is ultimately directed is underlined. A specific aspect of a skill or an understanding needed to learn a skill is in plain type.

3. Use

a.

1. Attacks problems in a rational manner.

- a. Sets up hypotheses.
- b. Figures out ways of testing hypotheses.

b.

2. Gathers information.

- a. Gains information by studying pictures.
- b. Gains information by observing the world around him.
- c. Gains information by conducting simple experiments.
- d. Gains information by using models.
- e. Gains information by making a survey.

c.

*1) Increases the accuracy of his observations through the use of de-

vices to promote reliability
such as a questionnaire.

*d. Interprets pictographs, bar graphs,
line graphs and circle graphs.

*e. Uses scatter diagrams to test hy-
potheses.

3. Uses effective geographical skills.

a. Has a sense of distance and area.

1) Compares distances.

2) Compares areas.

b. Has a sense of direction.

Knows cardinal directions.

Knows intermediate directions.

c. Interprets maps.

1) Interprets map symbols.

a) Interprets map symbols (color
layers) in terms of map legend.

*b) Interprets map symbols (color
gradients and shading).

*c) Interprets map symbols (iso-
metric lines) in terms of map
legend.

- *d) Interprets map symbols (contour lines).
- 2) Uses map scale to estimate distances.
- *3) Differentiates between small scale and large scale maps and knows when to use each.
- *4) Orients large scale maps in their proper place on small scale maps.
- 5) Uses system of parallels to identify relative distance from equator.
- 6) Tells directions from maps and globes.
 - a) Knows that North Pole is always to the north and South Pole always to the South.
 - b) Uses meridians and parallels to identify directions on maps.
- 7) Uses atlas index and global grid to locate places.
- *8) Identifies distortions on map.
 - *a) Identifies type of map distortion by comparing grid on map with grid on globe.
- 9) Draws inferences from maps.
- a) Draws inferences from a comparison of different map patterns of the same area.
- *10) Develops a system of regions to fit a particular purpose.
- 4. Organizes and analyzes data and draws conclusions.
 - a. Applies previously-learned concepts and generalizations to new data.
 - b. Classifies data.
 - *c. Uses simple statistical device of mean (average) to analyze data but recognizes that it does not reveal range and variation in data.
 - d. Tests hypotheses against data.

ATTITUDES :

1. Searches for evidence to disprove hypotheses, not just to prove them.
2. Respects evidence even when it contradicts preconceptions.
3. Is sceptical of the finality of knowledge; considers generalizations and theories as tentative, always subject to change in the light of new evidence.

4. Is sceptical of theories of single causation in the social sciences.
5. Is curious about social data.

ABBREVIATED OUTLINE OF UNIT

- I. The United States is located in the Western Hemisphere in the middle latitudes.
- II. The United States is the fourth largest country in the world.
- III. Since maps contain distortions of various kinds [as discovered by students in attempt to measure distances and areas], they must be used with caution.
- IV. One must know something about the site of an area in order to understand what it is like; site characteristics include both physical and man-made features.
 - A. By applying things we already know, we can make many useful guesses about what places are like as we study maps and pictures; these guesses or hypotheses can be checked against other data, including other maps.
 - B. Physical features differ widely from one place to another in the United States. Different patterns can be discerned in the distribution of each of the phenomenon.
 1. Elevations differ considerably from one part of the country to another. The United States is drained by many rivers which flow from higher elevations to lower elevations.
 2. Elevations do not indicate the amount of local relief and landforms; the distribution of these landforms also forms distinctive patterns on the map.
 3. Climate varies from one part of the country to another, and the country can be divided up into different climatic types.

4. Vegetation is affected by climate.
 5. Soils affect vegetation and the crops which can be grown and in turn are affected by vegetation and crops as well as by the basic rock from which they are formed, by climate, and by wind, water, and glacial action.
- V. United States Geography cannot be understood by studying only physical features; we must study the many ways in which man uses and modifies the physical environment.
- A. Physical boundaries are drawn by man; frequently they do not coincide with natural boundaries.
 - B. Men's agricultural activities are affected by but not determined by physical features.
 - C. Population is not distributed evenly across the United States; the uneven population pattern results from many factors. Population is growing, and many shifts are taking place in population patterns.
 - D. The location of industrial centers is affected by a variety of factors such as location of resources needed for production, location of power sources, transportation routes, access to markets, sources of labor supply, etc.
- VI. The United States can be divided into regions for further study.
- A. The geographer draws regional boundaries as a means of delimiting an area for the purpose of study; he can identify regions on the basis of different factors, depending upon his purpose.
 - B. The United States can be divided into regions in a number of different ways, depending upon the purposes of the geographer.
- VII. The geographer studies ~~what~~ places are like and what makes one place different from another; he uses a number of tools of analysis.

OBJECTIVES

- S. Interprets map symbols.
- G. Things can be located at specific points on the earth's surface.
- S. Visualizes generalized maps of U.S. and of North America and so is able to identify them on map.
- G. Places can be located in terms of their situation; situation describes a phenomenon in areal relationship with other phenomena with which it is associated, including distance and direction from such phenomena.

OUTLINE OF CONTENT

- I. The United States is located in the Western Hemisphere in the middle latitudes.
 - A. Continental United States is located in North America south of Canada and north of Mexico. Two states, Alaska and Hawaii, are located outside of the main boundaries of the country.
 - B. The United States can be located in relationship to countries of the world in terms of distance and direction.

TEACHING PROCEDURES

MATERIALS

1. Say: We are going to begin our study of geography this year by studying the United States. We will start by getting a picture of the United States as a whole.

Give pupils an overview of the unit, telling them something about the topics which they will be studying. Perhaps make a chart listing these topics (or listing major questions related to the topics) and post it on the bulletin board.

2. Hold up a big globe and ask a pupil to locate the United States. Then ask the class: Did he have to read all of the names to locate the United States? Why not? How did he recognize the United States so quickly? Pupils will undoubtedly point out that he knows the shape or knows it is in a certain spot in North America which he recognizes by shape. Point out that the shape is really a symbol found on a map. Put a word such as horse or dog or cat on the chalkboard. Ask: What do you think of when you see each word? The word is also a symbol standing for a certain thing. How does the symbol for the U.S. differ from a word symbol? What does the shape represent? (If possible show pictures of the U.S. taken from space to illustrate the fact that the symbols of countries are drawn to represent actual shapes of land.) Now have pupils locate the U.S. on a world map.

Large globe.
World map.
Pictures of U.S. taken from outer space by U.S. astronauts e.g. Meyer and Strietelmeier, Geography in World Society, p. 674.

3. Now ask, if it has not been brought out already: On what continent is the U.S. located? (Review meaning of continent.) What countries are located next to us? As each is pointed out, ask: In what direction is this country from the U.S.? How do you know? (Review briefly the fact that the north pole is always north and the south pole always south.)

Large globe.
World map.

16-

S. Knows cardinal directions.

S. Tells directions from maps and globe.

(Knows that the North Pole is always to the north and South Pole to the south.)

S. Compares distances.

S. Knows cardinal directions.

S. Knows intermediate directions.

G. Things can be located at specific points on the earth's surface, usually designated by an abstract grid and described in terms of latitude and longitude.

C. The grid of meridians and parallels helps one locate places in terms of exact points on the earth's surface and in terms of direction and distance from other places.

S. Uses atlas index and global grid to locate places.

Point out that North American is in the Western Hemisphere. Explain meaning of hemisphere. Then ask: What other places are in the Western Hemisphere besides the ones we have just mentioned? Point out that class will be studying the Western Hemisphere this year.

3. Ask pupils to locate the two states which are not attached to the main part of the U.S. In what direction are they from the continental U.S.? What are Alaska's nearest neighbors? In what direction are they from Alaska?

4. Now ask children what other countries they have studied in the past or know something about. (Pupils who have come through the Center's curriculum should mention such countries as Japan, Peru, the U.S.S.R., Nigeria, Israel, France, and India.) Have pupils locate these places, noting the direction and comparative distances from the United States or the children's own town on a globe. Ask: How do you know what direction some of these places are from the United States, since none but Peru is due north or south of the United States? (Review cardinal direction and intermediate directions.)

World map.
Globe.

5. Now point out that we have located the U.S. in two ways: first by noting the exact place on the face of the earth and second by noting where it is in relationship to some other places in the world. Say: Geographers have made maps for us and have located places for us on globes. However, they had to develop some system to use to locate places on the globe. We have located the U.S. by knowing its shape. Suppose we didn't know its shape. Or suppose we want to locate a place whose shape we don't know. The system worked out by geographers to locate places can help us. How do geographers describe exactly where places are on the earth's surface? Let pupils make some guesses. If they have come through the fourth grade course, they should know that geographers have developed a system of

Globe.
Filmstrips:
Latitude and
Longitude, Educational Audio-Visual, Inc.
Latitude, Longitude, and Time, Eye Gate House.
Atlas with index which uses longitude and latitude.

S. Uses meridians and parallels to identify directions on maps.

S. Uses parallels to identify relative distance from equator.

D. Continental United States is located in the middle latitudes, although Alaska is located in the high latitudes.

G. The rotation of the earth produces day and night, while the inclination of the earth and its revolution around the sun results in seasons and differences in temperature on the earth's surface.

G. Temperature and seasonal differences are affected in part by distance from the equator; temperature ranges are smaller nearer the equator than further away from it.

meridians and parallels which help us locate places. If not, take time at this point to use some of the activities from the unit on Trobriand Islanders in grade four to teach children the uses of and the characteristics of the global grid. Or show filmstrip which describes the grid. Then show pupils an atlas index which uses the global grid. Give pupils a dittoed exercise in which they are given the location of five or six places in terms of longitude and latitude and asked to locate places on a map.

6. Make sure that pupils understand the ways in which the global grid can be used to determine directions on the globe or a map. Give them an exercise in identifying directions on a map which shows parallels as curved lines. (e.g. Show two places, A & B, on the same line of latitude, but with one closer to the top of the map than the other. Ask: In what direction is A from B?)
7. Make sure that pupils understand the way in which the global grid can be used to determine distances north and south of the equator. Ask: What difference does it make whether or not a place is close to the equator or not? Review what pupils learned in earlier grades about the effects of the rotation of the earth and the revolution of the earth around the sun upon day and night, season and temperature. If pupils have not studied the Center's earlier courses which have demonstrated these relationships, use one of the activities (such as in the Kindergarten unit on Our Global Earth) or show one of the films or filmstrips which demonstrate the relationships and their effects.

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directions on the globe or a map.
giving directions on a map which
(e.g. Show two places, A & B,
but with one closer to the top of
in what direction is A from B?)

Dittoed map.

the way in which the global grid
lies north and south of the equator.
make whether or not a place is close
what pupils learned in earlier
rotation of the earth and the re-
sun upon day and night, seasons,
not studied the Center's earlier
these relationships, use one of
Kindergarten unit on Our Global
or filmstrips which demonstrates
ects.

Globe and light.
Filmstrip: Day
and Night, Educa-
tional Audio-
Visual Inc.
Film: What
Causes the Sea-
Sons, McGraw
Hill, 12 min.
Film: Causes of
The Seasons, 16
min., Coronet.

18.

S. Sets up hypotheses.

S. Compares areas.

G. Maps contain distortions of one kind or another.

S. Identifies distortions on maps.

II. The United States is the fourth largest country in the world.

A. China, the U.S.S.R., and Canada all exceed it in size.

8. Point out the 30th parallels north and south of the equator and explain that the areas falling between these two parallels are known as the low latitudes; they are close to the equator. Then point out the 60th parallels and the areas which fall between the thirtieth and sixtieth parallels and tell the class that these areas are known as the middle latitudes. Then point out the sixtieth parallels and explain that the area between these parallels and the poles are known as the high latitudes. Now ask: In which of these latitudes does the U.S. fall? does Alaska fall? What guesses can you make about the United States and about Alaska by knowing this information?

World map.

9. Say: We've been looking at the location of the United States in relationship to other places, and we couldn't help but notice something about the size of the U.S. as compared to some other countries. What is your general impression about its size? Where do you think it might rank in size? Let's check our guesses now by comparing its area and distances across it with those in other countries.

If possible, pass out a number of small globes to groups of children. If not, use a large globe in the front of the class. Ask several children to come up and compare the size of the U.S. with a number of other countries, including the U.S.S.R., China, Canada, France, and India. Or have a committee make tracings from a small globe on pieces of acetate to show outlines of these countries. (They should make these tracings as accurate as possible even if they cannot be completely accurate.) They should then outline the countries with different colored inks and project them as overlays with an overhead projector. Have another group of pupils make tracings of the same countries from a Mercator projection and make overlays of them. Compare the two sets. For example, compare Canada and the U.S. on both the Mercator map and the globe. What difference do children note? Do the same thing with other tracings. Children will note that the Mercator map exaggerates sizes of countries further from the equator.

Small globes or one large globe. Mercator map. Acetate. Overhead projector.

20-

S. Compares distances.

S. Identifies distortions on maps.

B. It is approximately 3,000 miles across the United States in an east-west direction and 1,500 miles in a north-south direction.

S. Uses map scale to estimate distances.

S. Identifies distortions on maps.

G. All maps contain distortions of one kind or another.

III. Since maps contain distortions of various kinds, they must be used with caution.

(This section is optional). It might be used in

10. Now have several pupils prepare charts of comparative distances on a Mercator map and on a globe. For example, one pupil might prepare a chart comparing the north-south distances of the U.S. and of Canada as shown on a Mercator projection. Another might do the same for the distances as shown on the globe. A third pupil might make a chart showing the comparative north-south distances in the United States and the Soviet Union as shown on a Mercator map. A fourth pupil could make a similar chart to show these distances as shown on a globe. Still other pupils could compare east-west distances at the northernmost points in Canada, the U.S. and the U.S.S.R. Compare each pair of charts (made from the globe and from the Mercator map). What differences do pupils note? Let pupils think of possible reasons for these differences which they can check shortly. Look once more at the charts made from the globe. How does the U.S. compare with Canada in terms of distances north-south and east-west? How does it compare with the U.S.S.R. in terms of these distances?

Globe.
Mercator map.
Chart paper.

11. Have pupils look at a map of the U.S. Ask: How can we tell how many miles it is across the country from one coast to the other? Review the use of the scale and have pupils make themselves map rulers and each figure out the east-west and north-south distances across the country. Now have them do the same thing for a map of Canada and for some other country in which they are interested.

Map of U.S.
Map of Canada

As indicated in the outline content, the following section of activities (to teach part III of the unit) may be omitted in entirety.

12. Say: We have found that the Mercator map distorts distances and areas. Lets look at some other examples of distortions and ways in which the Mercator map and other maps can be misleading. Show pupils two charts, one comparing Greenland and South America as

Charts showing
distortion on
Mercator map.

22

A. RESPECTS EVIDENCE EVEN WHEN IT
CONTRADICTS PRECONCEPTIONS.

average and above average classes. Teachers who wish to use many kinds of map projections should find it useful.)

A. All maps are distorted, since it is impossible to represent a round surface accurately on a flat map.

shown on a globe and one comparing them as shown on a Mercator map. What difference is there?

13. Say: Suppose you wanted to go by the shortest route from Seattle (point to on Mercator map) to Moscow. What direction would you go? Would Moscow be farther or closer than Peking? (point to on map) Place pupils' answers on board. Now have several pupils come to the front of the room and use the globe. Ask them the same questions and put their answers on the board. What differences are there in the two sets of answers? Why don't they agree? Show the class an azimuthal map centered on the north pole. Have pupils compare the two maps. What differences do they see? Which shows the air distance between the U.S. and U.S.S.R. the better? What disadvantages do pupils see in the polar map? Let pupils list up some possible disadvantages at this point which they can check later.
14. Ask: Why are these maps so distorted? Pupils may have some ideas. If not, take a rubber ball and use a magic marker to draw on the equator where the two parts are fastened together and the north and south poles. Then cut the ball in half at the equator and let several pupils try to flatten it out on a sheet of paper. Finally, cut a number of slits at the two poles so that it will lie flat. Now trace its outline on a piece of acetate. Project the acetate and ask pupils what would have to be done to make a connected map without the slits. (The pieces would have to be stretched to meet each other.) Show pupils a map which illustrates what such a map would look like if the areas toward the poles were only stretched in an east-west direction. What happens to the shape of continents? How could the shape be made more like the actual shape? (Stretch north and south too.)

as shown on a Mercator

shortest route from Seattle
in what direction would you
go to Peking? (point to
the globe. Ask them the
shortest route. What differences
do they see? Now
point to the north pole. Have
them draw the routes. Which
route is better? Which
map is better? Let pupils set
out which they can check

Mercator map.
Globe.
A zimuthal map
centered on
North Pole.

Pupils may have some idea.
Use a magic marker to draw on the
globe together and the north
pole at the equator and
draw on a sheet of paper.
Draw the poles so that it will
be a piece of acetate. Project
the map to be done to make a
map. Pieces would have to be
drawn. A map which illustrates
the areas toward the poles were
drawn. What happens to the
map? Can be made more like the
globe.)

Hollow rubber ball.
Magic marker.
Knife.
Acetate.
Overhead projector.

G. All maps contain distortions of one kind or another; each kind of map projection has both advantages and disadvantages, depending upon one's purpose in using a map.

S. Identifies distortions on maps.

S. Identifies type of map distortion by comparing grid on map with grid on globe.

G. All maps contain distortions of one kind or another; each kind of map projection has both advantages and disadvantages, depending upon one's purpose in using a map.

24

B. Different kinds of maps are used for different purposes; different kinds of distortions are used for different purposes.

1. One can identify distortions on a map by comparing the grid on a globe with the grid on a map.

2. Although all maps of the world are not distorted, all maps of the world are distorted in some way.

ortions of
each kind
both ad-
tages, de-
rpose in

s on maps.

p distor-
d on map

ortions of
each kind
both ad-
tages, de-
rpose in

24

B. Different kinds of maps have been developed for different purposes; each contains different kinds of distortions but has specific uses.

1. One can identify the type of distortion on a map by comparing its grid with the grid on a globe.

2. Although all maps are distorted somewhat, maps of countries or individual continents are not distorted so badly as are maps of the world.

15. Have pupils look at the Mercator map and see if they find any indication that this is, in effect, what has been done. If pupils do not notice it immediately, ask: What happens to the distance between the parallels as they get closer to the poles? Does the same thing happen on the globe? How can you tell from the Mercator map that the northern and southern parts have been stretched in an east-west direction? (Compare what happens to meridians on map and on globe.) Then ask: If the map is so distorted, does it have any advantages that outweigh its disadvantages? (Ask additional questions to help pupils see that shapes and masses are fairly accurate and that the grid can be used to detect distortions.)
16. Point out that pupils can detect distortion on any map by comparing the grid on the map with the grid on the globe. Have pupils identify once more the major features of the global grid on a large chart which can be mounted in the room. Name the map types: pupils several kinds of maps, including an equal-area map, a conic map, a type, an azimuthal map centered on the north pole, a map which looks as though a picture had been taken of the globe from a distance, and a map of the U.S. Make a chart to show how the grid features compare with those of the globe. Hang opposite the chart on the global grid. (Have pupils identify the map grid feature by feature and figure out what the grid in the globe grid mean in terms of such things as size, shape, and distance and shape.) Then ask: What possible advantages are there to each of these maps? (Be sure to have pupils compare the amount of distortion on world maps as compared with a map of the U.S.)
17. Ask: Which of these types of maps would you use if you want to compare sizes of different countries? What should you use if you want to measure distances between the U.S. and other parts of the world? You use a map of the United States to measure distances between cities? Why or why not?

Mercator map and see if they can find
 is, in effect, what has been done. If
 immediately, ask: What happens to the
 parallels as they get closer to the equator?
 on the globe? How can you tell from
 northern and southern parts of the map
 east-west direction? (Compare what
 map and on globe.) Then ask: Since this
 it have any advantages that you can see?
 to help pupils see that shapes of land
 and that the grid can be used to de-

Mercator map.
 Globe

detect distortion on any map by compar-
 with the grid on the globe. Have pupils
 major features of the global grid. Place
 can be mounted in the room. Now show
 maps, including an equal-area map of some
 centered on the north pole, an orthographic
 a picture had been taken of the earth
 of the U.S. Make a chart on each map
 features compare with those of the globe.
 on the global grid. (Have pupils compare
 feature and figure out what the changes
 terms of such things as size of area
 Then ask: What possible advantages
 maps? (Be sure to have children com-
 on world maps as compared to the

Globe
 Chart paper
 Equal-area map
 of World.
 Azimuthal map
 centered on North
 Pole.
 Orthographic map.
 Map of U.S.

of maps would you use if you wanted to
 countries? What should you do when you
 between the U.S. and other places? Can
 ed States to measure distances and iden-
 why not?

S. Sets up hypotheses.

IV. One must know
in order to identify
characteristics
features.

A. By applying
can make
are like
guesses
other data

G. Places can be located in terms
of site which relates a phen-
omenon to the detailed physical
setting of the area it occupies.

IV. One must know something about the site of an area in order to understand what it is like; site characteristics include both physical and man-made features.

A. By applying things that we already know, we can make many useful guesses about what places are like as we study maps and pictures; these guesses or hypotheses can be checked against other data, including other maps.

18. Now use a filmstrip or film to review distortions on different kinds of maps.

19. Introduce the next section of the unit by saying: We have now located the United States in terms of its specific position on the earth's surface and in terms of its situation or its relationship to other places. Locating places in terms of its position and situation permit us to make certain guesses about what places are like or about how people in an area live. What kinds of guesses did we decide we could make because of the position in terms of distance from the equator? (Review possibilities of guessing something about temperature and seasons.) What kinds of guesses might we make by knowing where places are in terms of other countries or places? (Let pupils make guesses about possible effects of the closeness of the U.S. to Canada and Mexico, about the situation of the U.S. in relationship to the Panama Canal, about the fact that the shortest distance between the U.S. and the U.S.S.R. is across the Polar regions. Point out that the class will check these guesses as they continue their studies.

World map.

Say: We have also looked at the size of the United States. Of what importance might the size be? Let pupils make guesses or hypotheses. Record them for checking during the course of the unit on the U.S.

20. Say: Usually, we want to know much more about a place than just what we can tell from its position, situation, or size. Suppose you were thinking of making a trip to Seattle. (Point out on map.) What would you want to know about it before you decided to go there for a visit? What would you want to know about Seattle before you would decide whether or not to move there to live? What

Map of U.S.

- G. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, people's skills, etc.
- G. Geographers ask different questions about places, depending upon their purposes at the moment.

S. Sets up hypotheses.

A. IS CURIOUS ABOUT SOCIAL DATA.

would you want to know if you were a manufacturer and were considering putting up a factory there? Why do the things you want to know differ in each situation?

Say: Geographers, too, may differ in the kinds of questions they ask about different places, depending upon their purposes. However, most of them want to know something about the site. That is, they want to know what physical features are found there and what man-made features are found there. They also want to know how people live there. In general, they are trying to find out why this place differs from others and how it is related to others. We have learned that we can make a number of guesses about places by knowing their size or their position and situation in relationship to other places. There are other ways in which we can make guesses too.

21. Say: You are now going to read a brief selection called "Making Geography Guesses." I am going to give you just the first section at this time. At the end of this section, the author asks you to examine a map and make your own guesses. Look at the map which I have posted and then list your guesses on a sheet of paper.

"Making Geography Guesses" (see Appendix.)
Map of state of Washington.

Give pupils time to read and to make their lists. Then discuss their guesses. Make a composite class list of hypotheses and discuss their tentative nature. This should be easy, as probably pupils will suggest some contradictory hypotheses. At this stage, do not identify guesses too strongly with individual pupils. Be sure to accept all of the guesses, even the contradictory ones, as hypotheses for further examination. It is essential that none of these ideas be ridiculed even if they are slightly or highly bizarre. The main purpose of the exercise is to get a rough estimate of the group's ability to interpret maps and to set the stage for the year's work by encouraging pupils to set up hypotheses of their own for testing.

Now give pupils the rest of the selection on "Making Geography Guesses" and have them complete the reading.

- S. Sets up hypotheses.
- S. Gains information by studying pictures.
- S. Draws inferences from maps.
- S. Tests hypotheses against data.
- A. IS CURIOUS ABOUT SOCIAL DATA.

Understands concept of elevation.

B. Physical features differ from place to place in the different patterns can be seen in the distribution of each of the

1. Elevations differ from part of the country. The Mississippi States is drained by the Mississippi from higher elevations

-30-

g pictures.

- B. Physical features differ widely from one place to another in the United States. Different patterns can be discerned in the distribution of each of the phenomenon.
1. Elevations differ considerably from one part of the country to another. The United States is drained by many rivers which flow from higher elevations to lower elevations.

22. Present geographic data to the class and have them develop "guesses" to explain what they see. For example, they might simply look at a map of any large area in the world and try to explain why a large city (such as London) is located where it is. Be certain to ask as well what it would take to prove the hypotheses (guesses) true or false. Project slide or show the class a picture of some place other than one of the places to be studied in detail during the year and have pupils list all of the things they think might be true about the place. (Perhaps divide class into groups for this activity.) Then show the class where the place is and let pupils read to check on their guesses.
23. Remind the class that they will now look at characteristics of the United States as a whole before they study individual parts of the country. This will help them see the big picture and where and how the various parts fit together. They will be using maps and pictures and other kinds of data and will make and check many guesses.
24. Review the meaning of elevation. If pupils have not studied Center's primary grade courses, you may wish to use an activity similar to that used in the Quechua unit (grade one) or do such activity as the following to teach pupils the meaning of the concept.

Draw a cross-section diagram showing sea level, low coastal area, a hilly area, a higher plateau region, mountains, and a high plateau on the other side of the mountains. Make the diagram on a large sheet of paper. Then draw parallel lines across the diagram beginning at sea level and at half inch intervals to the top of the highest mountain peak. Say: Suppose each of these half inch lines represents 100 feet. Let's start at sea level and measure the height of the places in the diagram above sea level. Is each place more rugged than that which is lower? If we say that

the class and have them develop
 hey see. For example, they might
 large area in the world and try
 (such as London) is located where
 s well what it would take to prove
 ue or false. Project slide or show
 place other than one of the places
 ing the year and have pupils list
 k might be true about the place.
 groups for this activity.) Then tell
 d let pupils read to check on their

Map of England.
 Slide or picture
 of some area;
 should contain
 rather obvious de-
 tails for use in
 hypothesizing.

will now look at characteristics of
 e before they study individual parts
 help them see the big picture and
 arts fit together. They will be using
 kinds of data and will make and test

tion. If pupils have not studied the
 ses, you may wish to use an activity
 Quechua unit (grade one) or do some
 ing to teach pupils the meaning of the

Teacher-made
 Cross-sectional
 diagram.

m showing sea level, low coastal plains,
 eau region, mountains, and a high pla-
 he mountains. Make the diagram on a
 draw parallel lines across the diagram,
 at half inch intervals to the top of
 Say: Suppose each of these half inches
 start at sea level and measure the
 diagram above sea level. Is each higher
 which is lower? If we say that this

- S. Applies previously-learned concepts and generalizations to new data.
- G. Rivers flow from higher elevations to lower elevations.
- S. Sets up hypotheses.
- A. SEARCHES FOR EVIDENCE TO DIS-
PROVE HYPOTHESES, NOT JUST TO
PROVE THEM.
- S. Tests hypotheses against data.
- S. Interprets map symbols (color
layers) in terms of legend.
- G. Unevenly distributed phenomena
form distinctive patterns on
the map.
- G. Maps make it possible to discern
patterns and relationships a-
mong a vast amount of data.
- S. Interprets map symbols (color
layers) in terms of map legend.

place (point it out) has an elevation of 1000 feet, what do we mean? If we say that this place (point to the mountain peak) has an elevation of 4000 feet, what do we mean, etc.?

25. Show pupils a map of the U.S. which indicates only the river systems and major lakes; not elevations or landforms. Ask: Given what you already know about rivers, where do you think the higher lands would be? Where do you think the lower lands would be? Let pupils use outline maps to draw in their guesses.
26. To enable pupils to check their hypotheses, show them an elevation map of the United States which indicates elevation by the use of color layers (and no shading or hachures or raised relief). Review the use of color layers, or if pupils have not had the Center's earlier courses, teach them the meaning at this time. Be sure to check their understanding by asking: What does the green on the map mean? What does the dark brown mean? Ask a pupil to point out the key and read aloud the meaning for the different colors. Note differences in elevation around the country. Check the pupils' hypotheses (made in activity 25), eliminating those which are incorrect and modifying others. What general statements can pupils make about the "pattern" of elevation which they see? Now show pupils a table which presents data on elevations for a number of cities in this country. Does the table or the map make it easier for them to understand the elevation pattern? Why?
27. Use the same map and ask: Can you tell from this map what the land looks like? (Can you tell where the hills and flat places are? Can you tell what areas have grass and trees?) Perhaps project some pictures or slides of areas which have the same

on of 1000 feet, what do we
point to the mountain peak)
do we mean, etc.?

h indicates only the river sys-
ns or landforms. Ask: Given
, where do you think the higher
the lower lands would be?
in their guesses.

Outline map of U.S.
showing only Rivers,
Lakes, and perhaps
state boundaries.
Set of desk out-
line maps of U.S.

potheses, show them an eleva-
h indicates elevation by the
g or hachures or raised re-
yers, or if pupils have not
teach them the meaning at this
erstanding by asking: What does
does the dark brown mean? Ask
read aloud the meaning for the
es in elevation around the coun-
(made in activity 25), elim-
and modifying others. What
e about the "pattern" of eleva-
pills a table which presents data
es in this country. Does the
or them to understand the ele-

Physical map of U.S.
showing elevation
by use of color lay
ers.

List of elevations
of a No. of cities
in U.S.

you tell from this map what the
where the hills and flat places
ve grass and trees?) Perhaps
of areas which have the same

Same map as for
26.

A. RESPECTS EVIDENCE EVEN WHEN IT
CONTRADICTS PRECONCEPTIONS.

S. Interprets map symbols (color
gradients and shading).

Understands site concepts re-
lated to landforms (e.g. plains,
plateaus, hills, mountains).

S. Applies previously-learned con-
cepts and generalizations to
new data.

2. Elevations do not indicate the amount of
local relief and landforms; the distribu-
tion of these landforms also forms dis-
tinctive patterns on the map.

a. The major types of landforms consist
of plains, hills, mountains, and pla-
teaus.

S. Gains information by studying
pictures.

Understands site concepts re-
lated to landforms (e.g. plains,
plateaus, hills, mountains).

color on the map but which have very different surface relief and vegetation in order to help pupils understand the need to read a map in terms of the map legend.

28. Now show pupils a physical relief map which uses color gradations and shading. Why don't the map makers have sharp changes in color from one color to another? Why do they have them merge into each other? Review meaning of hills, mountains, plains and plateaus. Have pupils locate examples of each on a physical terms relief model and then on a raised relief map of the U.S.
29. If pupils have not studied the Center's primary grade course or if the review session indicates that they do not really know much about the different kinds of landforms, you may wish to use several activities such as the following:
 - a. Show pictures of different physical features and locate them on the map. Or mount a map on the bulletin board with pictures around it, each attached by a string to the proper location.
 - b. Or prepare a bulletin board display entitled "Where in the World Have You Been?" Mount a map of the world on the bulletin board and let pupils bring pictures of places where they have been to mount around the map. Connect pictures to appropriate places on map with strings and pins, and have pupils prepare title cards for each picture to indicate landforms shown in picture.

have very different surface relief
help pupils understand the need to
map legend.

Physical map which uses color gradients
Map makers have sharp changes in
color? Why do they have them merge
coloring of hills, mountains, plains,
Give examples of each on a physical
map in a raised relief map of the U.S.

Physical map of
U.S. which uses
color gradients
and shading.
(e.g. Borchert and
McGuigan, Geography
of the New World,
pp. 6-7.
A physical terms
relief model.
Raised relief map
of U.S.

Center's primary grade courses,
states that they do not really
know kinds of landforms, you may wish
to show as the following:

Identify present physical features and locate
on a map on the bulletin board with
each attached by a string to the

Map of the U.S.
Pictures of land-
forms.
String and pins.

bulletin board display entitled "Where in
the world?" Mount a map of the world
and let pupils bring pictures of
landforms to mount around the map.
Appropriate places on map with string
pupils prepare title cards for each
landform shown in picture.

Map of world.
String and pins.

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Understands concepts of valley and gorge.

1) Mountains and plateaus may be cut by deep valleys and gorges.

- c. Prepare sets of slides or collect Viewmaster reels showing some of the concepts such as mountains, plains, plateaus, hills, etc. which you wish pupils to learn to understand. Select slides to illustrate the differences which exist within the concept classification as well as the aspects which all of the members of this class have in common. (e.g. Show different types of plains areas or different types of mountains. Include examples of same landform in several climates or vegetation regions so as not to develop stereotypes.) Place a viewer or a projector with a small screen on a table in the room and let pupils select the slide cartridges they need to view. Or ask those who need remedial work to examine a specific set of slides.
- d. Prepare a bulletin board display entitled "What is a Mountain?" Use cross sectional diagrams and pictures on the board. Under the display, place a table with a relief model of a mountainous area. Perhaps have a three dimensional viewer with scenes of different mountain areas which pupils can view individually. Or use one of the newer small screens and projectors which pupils can operate to view different slides about mountains.
- e. Use some of the commercially prepared charts showing land-forms and map symbols which represent them.
- f. Show pictures of deep valleys and gorges cut through mountains and plains. Show also on concepts model.
- Slides of land-forms.
- Diagram and pictures of mountains.
Relief model of mountainous area.
Viewmaster and mountain slides.
- e.g. Nystrom's Map Symbols and Geographic Terms Charts.
- Pictures of valleys and gorges.
Concepts model (e.g. Nystrom Geographical Terms Model).

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Understands concept of mesa and butte.

2) Mesas and
on high

Understands site concepts related to landforms (e.g. plains, plateaus, hills, mountains, valleys, gorge, mesa, butte)

G. Unevenly distributed phenomena form distinctive patterns on the map.

b. Landforms form
the map.

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2) Mesas and buttes are frequently found on high plateaus.

b. Landforms form distinctive patterns on the map.

- g. Now show pictures of mesas and buttes and explain meaning of these terms. (The concept of mesa should be review for pupils who have come through the Center's first grade course.)
 - h. Evaluate pupils' knowledge of different kinds of landforms by projecting a series of slides which you can number orally. Have each pupil write the type of landform after each number on a sheet of paper. Or mount pictures and number them and place them on a bulletin board. Give pupils sheets of paper on which they can write the name of the landform shown in each picture. You may also wish to build your own model to show a number of different landforms. Paint in a number on each and ask pupils to identify them on a sheet of paper.
30. Show pupils a relief map once more (preferably a raised relief map). Ask: What generalized pattern of landforms do you see on the map? (e.g. Where are the mountains? Are the Rockies or the Appalachian mountains the higher? Where are the plains? Where are the high plateaus? Where are the hilly regions?) Perhaps have pupils contrast pictures of Appalachian Mountains and Rocky mountains.

es of mesas and buttes and explain meanings. (The concept of mesa should be reviewed who have come through the Center's first

knowledge of different kinds of landforms. series of slides which you can number orally. pupil write the type of landform after each set of paper. Or mount pictures and number them on a bulletin board. Give pupils on which they can write the name of the in each picture. You may also wish to build to show a number of different landforms. er on each and ask pupils to identify them per.

once more (preferably a raised relief generalized pattern of landforms do you see on are the mountains? Are the Rockies or the e higher? Where are the plains? Where Where are the hilly regions?) Perhaps tures of Appalachian Mountains and Rocky

Pictures of mesas and buttes, (e.g. See Nystrom Map Symbols and Geographic Terms Charts.)

Slides or pictures of different landforms. Model of landforms without concepts identified.

Relief map of U.S. or system transparencies on Major Land Forms. For pictures of Appalachian mountains, see plates 12 of Informative Classroom Pictures set on The South. For pictures of Rockies see old National Geographics; books and pamphlets on some of National Parks. (e.g. U.S. Dept. of Interior, Natural Resources)

G. Nature changes the face of the earth through physical processes.

S. Sets up hypotheses.

S. Tests hypotheses against data.

S. Sets up hypotheses.

G. A river which moves rapidly carries with it much sediment and frequently cuts deep valleys.

-40-

the
cesses.

- c. Landforms have been created by a variety of natural physical forces.

ata.

ent
alleys.

- d. Rivers which flow swiftly look quite different from slowly moving rivers and have very different effects upon the areas through which they flow.

31. Although pupils have probably studied many of these landforms in earlier grades, they probably have not learned much about the reasons for differences in landforms. At this point you may ask: Why do you think there are these differences in landforms in different parts of the country? Let pupils make guesses. Then show them the filmstrip Story of a Mountain. Some pupils might also enjoy doing some of the following activities:
- a. Preparing an oral report on the sudden emergence of the land near Iceland.
 - b. Reading the book All About the Ice Age to learn more about the effects of glaciers.
 - c. Examining sets of slides or pictures of the Badlands and talking about the way in which they were created.
 - d. Reading the pages in The World We Live In on how different land forms are created.
32. Some of the analysis of how mountains are made and are eroded may illustrate some of the effects of rivers. Now remind pupils that they were able to tell a good deal about elevation patterns in the country by examining a map of river systems. Say: Let us see what we do know about rivers. (Review such facts as that

of Colorado); Life,
May 29, 1964, pp.
48ff.

studied many of these landforms in
have not learned much about the
forms. At this point you might
these differences in landforms
y? Let pupils make guesses and
ry of a Mountain. Some pupils
the following activities:

Filmstrip: Story
of a Mountain,
E.B.F.

the sudden emergence of an island

Thorarinsson, "Surt-
sey: Island Born of
Fire," National
Geographic, May, 1965,
pp. 713-726.

the Ice Age to learn more about

Lauber, All About
the Ice Age.

pictures of the Badlands and read-
they were created.

National Park Ser-
vice, Badlands
National Monument
(booklet)

ed We Live In on how different

Life Editorial
Staff, The World
We Live In, pp. 42-
62.

ains are made and are shaped will
of rivers. Now remind pupils that
deal about elevation patterns in the
ver systems. Say: Let's see what
ew such facts as that they flow

Nystrom Map Symbols
and Geographic Terms
Charts.
Map of Mississippi
delta on p. 248

G. A river which moves slowly across a plain drops gravel and sand that it has moved from higher areas.

S. Differentiates between small scale and large scale maps and knows when to use each.

e. Landforms can be seen more easily on large-scale maps than on small-scale maps; however, small-scale maps show situation better.

from higher elevations to lower elevations, that rivers which flow rapidly cut deep valleys or gorges and carry off much silt, etc.) Pupils may not know much about slowly-moving rivers. You may wish to show them pictures and maps showing ox-bow rivers, and deltas such as at New Orleans. Ask: Why do you think the Mississippi (or whatever river is shown) splits up like this? Why doesn't it develop just one big channel? Why do you think the river twists and turns like this? Why doesn't it cut through at these places (point to places on map or picture) and straighten itself out more? Perhaps call attention of pupils to elevation and land forms in region and ask: Do you think the river would be flowing swiftly or slowly here? Why? You may also wish to demonstrate the way in which slowly moving water drops silt by very slowly pouring extremely muddy water into one end of a sink and noting the residue which remains after the water has gone down the drain.

33. Look at a large wall raised relief map of the U.S. Have pupils locate hills and mountain peaks. Ask: Do you think this map shows every hill in the country (or in our state)? Do you think it shows every mountain peak? Why not? Have pupils look at the Mississippi River. Ask: From what you have seen of rivers do you think the river really is as straight as it looks on this map? Show a picture of the Mississippi which shows it twisting and turning at a spot which looks straight on the map. Ask: Why doesn't the map show these curves in the river? Ask children to look at the outline of Lake Superior. Ask: From what you have seen of lakes, do you think the lakeshore is really as smooth as this? Show pictures of points and inlets in the lake and ask why the map does not show all of them. Pupils will probably quickly point out that the map is too small to show small details such as these. Ask: What would we have to do if we wanted to make a map to show such details? (Use a larger scale). (Perhaps review the way in which pupils drew their own maps to different scales in earlier grades.) Now show pupils large scale maps, preferably of the same place on the river or the same place on Lake Superior where the pictures were taken. Or use the series of three maps

to lower elevations, that rivers which
 valleys or gorges and carry off much silt,
 how much about slowly-moving rivers. You
 pictures and maps showing ox-bow rivers,
 New Orleans. Ask: Why do you think the
 river is shown) splits up like this?
 just one big channel? Why do you think
 turns like this? Why doesn't it cut through
 to places on map or picture) and straighten
 to call attention of pupils to elevation
 and ask: Do you think the river would be
 like this? Why? You may also wish to demon-
 slowly moving water drops silt by very
 muddy water into one end of a sink and
 what remains after the water has gone down

and picture of curve
 in Missouri River
 on p. 254 of Finch
 et. al. Earth and
 Its Resources.

raised relief map of the U.S. Have pupils
 in peaks. Ask: Do you think this map
 of country (or in our state)? Do you think
 peak? Why not? Have pupils look at the
 : From what you have seen of rivers do
 ally is as straight as it looks on this map?
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 (Use a larger scale). (Perhaps review the
 how their own maps to different scales in
 how pupils large scale maps, preferably of
 river or the same place on Lake Superior
 taken. Or use the series of three maps

Raised relief map
 of U.S.
 Pictures of curves
 in upper Mississippi
 and Lake Superior
 Shoreline.
 Large-scale maps
 showing areas in
 pictures.
 Kohn and Drummond,
The World Today,
 pp. 40-41.

S. Orients large-scale maps in their proper place on small-scale maps.

S. Uses map scale to estimate distances.

S. Interprets map symbols (contour lines).

S. Interprets maps symbols (contour lines).

of different scale showing New York and Manhattan Island and Drummond.

Ask: If large-scale maps show so much more detail, why do we ever use maps of smaller scale such as this? (Point to the map of the U.S. or to the map of smallest scale of New York and Drummond.) Discuss the advantages and disadvantages of maps of small and large scale.

34. Show pupils a topographical quadrangle or a topographical sheet of a larger area -- perhaps one of the raised relief models prepared by the Aero Company. Ask: How can you find out where this small-scale map fits in terms of the small-scale map of the United States? If necessary, ask further questions to help pupils find out that they can orient the map in its place on the U.S. map by the lines indicating longitude and latitude on each.
35. Ask: Where can you find out what the scale is that is used on a map? Have children locate the scale on a number of maps. Give children a series of exercises in measuring distances using different types of scales.
36. Show pupils the topographic map once more. Point out the contour lines on it, without calling them by name. Ask what they think these lines may show. Perhaps have some children look for similar lines on a raised relief model of a quadrangle and try to decide what they represent. Then tell pupils that these lines are known as contour lines and that they can be used to show surface relief in much more detail than can be shown on small-scale maps. Use one or more activities such as the following to help pupils learn how to read contour lines.
 - a. Set up small groups of pupils. Have each group make a model of a hill or mountain out of modelling clay. Urge pupils to make rather elaborate models with valleys, gently sloping

ing New York and Manhattan Island in Kohn

os show so much more detail, why do we
er scale such as this? (Point to the map
ap of smallest scale of New York vicinity.)
and disadvantages of maps of small and

ical quadrangle or a topographical sheet of
s one of the raised relief models prepared
ask: How can you find out where this large-
of the small-scale map of the United
ask further questions to help pupils see
e map in its place on the U.S. map by using
ngitude and latitude on each.

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es and that they can be used to show sur-
e detail than can be shown on small-scale
activities such as the following to teach
ur lines.

f pupils. Have each group make a model
out of modelling clay. Urge pupils to
models with valleys, gently sloping land

U.S.G.S. topograph-
ical sheets.
U.S.G.S. raised re-
lief quadrangles
prepared by the
Aero Co. (Available
from Nystrom.)

U.S.G.S. topograph-
ical sheets or
raised relief quad-
rangles prepared
by the Aero Co.
(Available from
Nystrom.)

Modelling clay;
knife; paper.

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S. Gains information by using
models.

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in some places and steep slopes in others. Then have a member of the group slice the model along these lines and label them. Others can trace the outlines of the pieces on sheets of paper to form a contour map of the model. (Pupils figure out where to place each new outline by fitting the pieces together again and measuring the distances from the end of the last contour line to the place where the next piece fits.)

Now have pupils fit their models together again and note what happens to the contour lines where the models show hills and where they show more gradual hills. What happens where they have built a valley into the model? etc. Compare the models and the contour maps.

- b. Give pupils a contour map of an imaginary island and have them build a model of the island by tracing the lines on sheets of corrugated cardboard, tracing both the line to be cut and the next inner line where the next sheet of cardboard should be placed. Glue the sheets of cardboard together at the appropriate places. Afterwards, pupils can cover the cardboard with a thin coat of clay which can be painted. Or the models can be left without such a coating.
- c. Prepare a model out of plastic or clay which hardens and will not be affected by water. Place it in a pan of water which is higher than the model. Fasten a ruler to the inside of the pan. Then pour in a half inch of water and have pupils draw a line on the model along the water line. Pour in another half inch of water and draw the next line, and so on. Afterwards, pupils should be able to see fairly clearly how to connect points of equal elevation.
- d. Use Hubbard's transparent contour relief model to demonstrate contour lines and teach pupils to read them.

deep slopes in others. Then have one member place the model along these lines and number the outlines of the pieces on a sheet contour map of the model. (Pupils can figure each new outline by fitting the model measuring the distances from the outer edge line to the place where the next section

their models together again and notice contour lines where the models show steep slopes and where they show more gradual hills. What happens when a valley is cut into the model? etc. Compare contour maps.

map of an imaginary island and have the island by tracing the lines on cardboard, tracing both the line which is the inner line where the next sheet of cardboard is placed. Glue the sheets of cardboard in appropriate places. Afterwards, pupils could cover the model with a thin coat of clay which can be left without such a cover.

of plastic or clay which hardens and will hold its shape. Place it in a pan of water which will float the model. Fasten a ruler to the inside edge of the pan in a half inch of water and have pupils place the model along the water line. Pour in another half inch of water and draw the next line, and so on. Afterwards, pupils will be able to see fairly clearly how the lines show the elevation.

present contour relief model to demonstrate how pupils to read them.

Dittoed contour map of imaginary island
Corrugated cardboard
Scissors

Model of clay or plastic
Ruler
Tall can or pan.

Transparent Contour Relief Model
(Hubbard Scientific Co.)

S. Differentiates between small scale and large scale maps and knows when to use each.

S. Interprets map symbols (contour lines).

S. Interprets map symbols (color layers).

S. Applies previously-learned concepts and generalizations to new data.

3. Climate
to an
into

- nd
3. Climate varies from one part of the country to another, and the country can be divided into different climatic types.

37. Show pupils a topographic sheet again and have them notice specific landforms in the area shown. Have them compare what they see in this map with what they see in the same place on the small-scale map of the U.S.
38. Give pupils exercises in reading simple contour maps. Questions might be aimed at finding out if they can figure out elevation steepness of slope, where valleys are, etc. Pupils could also use the map scale to figure out the area covered by the hill or mountain. (Perhaps use Hubbard's transparent contour-relief model kit to build map for exercise. Build a cardboard model of the map to use in helping pupils check their answers.)
39. Now show pupils a color layer elevation map once more to illustrate how the boundary lines between colors are really contour lines but lines in which the intervals are much larger than on topographic maps (thousands of feet rather than ten or fifty or a hundred feet.)
40. Say: These physical characteristics of site which we have just studied are not the only ones of importance in finding out what places are like. For example, look at the physical map of Minnesota. Can you see any reason why many Minnesotans leave the state to live elsewhere--say in California? Why might some people want to leave the state? Would you ever like to leave in the winter time? Where would you like to go during winter? Why? Tell pupils that many go to California, Florida, and Arizona--some just for winter vacations and some to live permanently. Why might they go there? Also point out that some return because they decide they prefer Minnesota climate. (Adjust this activity to fit the state in which pupils live.)

Now ask: Why might the U.S. have many different kinds of climate?

ic sheet again and have them notice
he area shown. Have them compare what
th what they see in the same place on
the U.S.

U.S.G.S. topograph-
ic sheet and re-
lief map of U.S.

n reading simple contour maps. Questions
ng out if they can figure out elevations,
re valleys are, etc. Pupils could also
gure out the area covered by the hill or
Hubbard's transparent contour-relief
for exercise. Build a cardboard model
lping pupils check their answers.

Dittoed contour map.
Hubbard's model.
(see above.)

layer elevation map once more to illus-
lines between colors are really contour
h the intervals are much larger than on
ands of feet rather than ten or fifty or

Color-layer eleva-
tion map of U.S.

racteristics of site which we have just
y ones of importance in finding out what
xample, look at the physical map of Min-
y reason why many Minnesotans leave the
--say in California? Why might some
e state? Would you ever like to leave
ere would you like to go during winter?
many go to California, Florida, and Ari-
ter vacations and some to live perma-
go there? Also point out that some re-
e they prefer Minnesota climate. (Adjust
e state in which pupils live.)

Physical map of
Minnesota or U.S.

U.S. have many different kinds of climate?

S. Draws inferences from maps.

a. Temperatures vary in different parts of the country. Different parts have the same temperatures found in northern parts of the country.

1) Temperature is affected in different parts of the equator.

S. Interprets map symbols (color layers) in terms of map legend.

S. Applies previously-learned concepts and generalizations to new data.

G. Temperature and seasonal differences are affected in part by distance from the equator.

S. Applies previously-learned concepts and generalizations to new data.

2) Temperature is affected in different parts of the large bodies of water. Direction of wind.

G. The ocean and other large bodies of water do not heat up so rapidly as land nor cool so rapidly as land.

G. Winds which blow over warm bodies of water (or land areas) carry warm air to nearby land areas.

S. Gains information by conducting simple experiments.

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a. Temperatures vary considerably from one part of the country to another; not all parts have the great seasonal differences found in northern United States.

1) Temperatures and growing seasons are affected in part by distance from the equator.

2) Temperatures and growing seasons are affected in part by closeness to large bodies of warm water and direction of wind.

41. Show the diagram "Spring Travels Northward" in Carls, et al. Ask: Is there a definite relationship between latitude and beginning of spring? Does this relationship always hold true? (Note: This map does not indicate the length of the growing season but rather only the beginning of it.)

42. Now show pupils a map of the length of growing seasons (period between frosts). Be sure that they examine the map legend and understand what the color layers mean. Have them note places where the seasons are longest, where they are shortest.

Then ask: What would affect the growing season. Pupils should be able to identify the distance from the equator as one factor since it was reviewed in an earlier activity. If not, review the idea once more in terms of the relationships between the earth and the sun.

43. Ask: How can you explain the fact that the growing seasons are longer on the west coast than they are in other places at the same latitude? Call attention to the location close to the Pacific and to the direction of prevailing winds in this area. Why might this location affect the growing season and temperatures in general? Pupils who have come through the Center's third grade course may be able to identify the reason, although it should be reviewed at this time. Otherwise, it will be necessary to teach the effects of closeness to large bodies of warm water by doing one or more of the following activities:

- a. Do the experiment suggested in activity 5 in the unit on Paris in grade three. It involves timing the speed with which soil and water heat up when placed on a warming tin and the speed with which they cool off when placed in contact with ice.

els Northward" in Carls, et al.
 tionship between latitude and the
 is relationship always hold true?
 cate the length of the growing sea-
 ning of it.)

Carls, Sorenson,
 and Howarth, Our
United States In
a World of Neigh-
bors.

length of growing seasons (periods
 t they examine the map legend to
 ers mean. Have them note places
 , where they are shortest.

Borchert and Mc-
 Guigan, Geography
of the New World,
 p. 24.

the growing season. Pupils should
 nce from the equator as one factor,
 earlier activity. If not, review
 f the relationships between the

Plate 13 in In-
 formative Class-
 room Picture Set
 on The South.

fact that the growing seasons are
 they are in other places at the
 n to the location close to the
 of prevailing winds in this area.
 t the growing season and tempera-
 have come through the Center's
 e to identify the reason, although
 time. Otherwise, it will be nec-
 effects of closeness to large
 one or more of the following ac-

d in activity 5 in the unit on
 involves timing the speed with
 up when: placed on a warming tray
 they cool off when placed in cans

Electric warming
 tray. Cans of same
 size filled with
 soil and water.
 Two thermometers.
 Ice in large pan.

G. Winds which blow over cold land areas or cold water bring cool air to nearby land areas; winds which blow over warm bodies of water or land areas bring warm air to nearby land areas.

G. Places in the interior of continents tend to have greater extremes of temperature than places along the coast.

S. Interprets map symbols (isometric lines) in terms of map legend.

S. Interprets map symbols (color layers) in terms of map legend.

3) Temperatures are affected in part by elevation.

- b. If pupils live in an area close to a river or lake, ask them what happens in winter. Does it freeze over as soon as we get freezing temperatures and snow? Which freezes over so -- small puddles of water or a lake or river? Have you ever seen steam rising from the river or lake in the winter time before it is frozen over? What does it remind you of? Why do you think the steam rises or the body of water does not freeze over sooner? Try to use a series of questions to bring out the fact that large bodies of water do not cool so rapidly as do land areas. Then ask questions to help pupils see that these bodies of water do not warm up so rapidly as land areas either. This should be fairly easy for pupils to understand if they have gone swimming in rivers or lakes in the spring or summertime.
44. Now discuss the effects of winds further. If pupils live in Minnesota or the Upper Midwest, remind them of the cold, icy days they sometimes get in the winter. Tell them about the winds coming down from Canada. Are all days this cold? What happens when the winds blow from the south? Ask pupils to note the effect of Gulf of Mexico upon temperatures in plains region.
45. Show pupils a map of January temperatures. Ask them what these lines remind them of (contour lines). What do contour lines connect? (elevations of equal value) Have pupils examine the map legend to find out what these lines connect. (lines of equal mean temperature in January). Or you may wish to begin by giving pupils maps on which a number of mean January temperatures are located and ask pupils to draw lines between temperatures which are the same. Then have them compare this map with

to a river or lake, ask them
it freeze over as soon as we
snow? Which freezes over sooner
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Then ask questions to help pu-
water do not warm up so rapidly
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the south? Ask pupils to note
eratures in plains region.

Map of U.S.

atures. Ask them what these
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c) Have pupils examine
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Or you may wish to begin
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Map showing mean
January and July
temperatures in
U.S. (e.g. Deasy,
et. al., The
World's Nations,
p. 30.) or see
Nystrom trans-

- S. Applies previously-learned concepts and generalizations to new data.
- G. Temperature is affected by factors such as distance from the equator, elevation, distance from warm water bodies, prevailing winds, and physical features which block winds from certain directions.
- G. Temperature is affected in part by elevation; air is cooler at higher elevations than at lower elevations if latitude and distance from the sea are the same.

a contour map to see how the same principle is used in connecting points of equal value by lines. Next have pupils examine the map of January temperatures. Fill in the areas between lines with different colors to show how one could make a color layer map to show the same information. Be sure to add a color key as a legend. Have pupils examine the map to notice temperature patterns. To what extent do the lines follow lines of latitude? How do they explain places where temperatures lines vary from the parallels? Now have pupils examine a map of July temperatures and note variations from the parallels. Ask: How can you explain the differences other than those along the west coast?

parencies on
Average Temperature.

If pupils have had the Center's primary grade courses, they should be able to guess that elevation may be a factor. Let them state their guesses about how elevation might be affecting the temperature in certain places. Then let them check their guesses by comparing an elevation map with a temperature map.

If pupils have not come through the earlier courses, begin by having them compare the elevation and temperature maps. Ask pupils to look across the country from east to west along certain lines of latitude. Ask: Where are the temperatures lower -- in areas of high elevation or areas of low elevation? Then do one or more of the following activities to help pupils understand the effects of elevation upon temperatures:

Elevation and
temperature maps
of U.S.

- a. Use activities in the Quechua unit (grade one) to help pupils understand the effects of altitude upon temperature.
- b. Tell pupils that temperature is about $3\frac{1}{2}$ degrees colder as one goes up each 1,000 feet. Have a pupil investigate the scientific reason for the differences in temperature at different elevations and prepare a chart showing approximate changes in temperature at different elevations.

S. Uses simple statistical device of mean (average) to analyze data but recognizes that it does not reveal the range and variation in data.

4) Maps of concealed temperatures within

S. Interprets map symbols (isometric lines) in terms of map legend.

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ces
B-
- 4) Maps or charts of mean temperatures conceal the range and variations of temperature both from day to day and within any 24 hour period.

- c. Show the filmstrip Effect of High Ground which describes the effect of elevation upon climate.
46. Whether you are just reviewing the effects of elevation upon temperature or teaching them for the first time, be sure to ask Do you think that all of the changes in temperature which result from elevation can be shown on this map of the United States? Why not? (scale is too small to show all of variations)
47. Now ask pupils to look at the temperature maps for their own area. What is the average temperature in January? in July? Are all days in January this cold? Are all days in July this hot? Review meaning of average or use one of the following activities to teach it if necessary:
- Compute the number of children for the average family of pupils in this classroom. If the average is not a whole number, the elusiveness of the average can be pointed out. (Averaging obscures the extremes of any distribution. Generalizations are a form of averaging and youngsters should be aware of the process.)
 - Have students suggest other data for which averaging is an appropriate technique (e.g. Little League batting averages, average class size in the school, etc.) Be sure that pupils have clearly in mind what the average is useful for as well as its limitations in terms of what it hides or obscures.
48. Clip and post the weather map and chart which appears in most daily newspapers. Review meaning of map symbols. Youngsters should have the opportunity to view change in weather patterns and to plot the high and low temperatures on a classroom graph.

Effect of High Ground which describes
ion upon climate.

Filmstrip: Effect
of High Ground,
Educational Audio-
Visual Inc.

viewing the effects of elevation upon
them for the first time, be sure to ask:
f the changes in temperature which re-
be shown on this map of the United
le is too small to show all of variations)

at the temperature maps for their own area.
perature in January? in July? Are all
ld? Are all days in July this hot? Re-
or use one of the following activities
y:

See temperature
maps above.

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nity to view change in weather patterns
d low temperatuaes on a classroom graph.

S. Uses simple statistical device of mean (average) to analyze data but recognizes that it does not reveal the range and variation in data.

S. Interprets line graphs.

G. The time of year when an area receives its precipitation is important to agriculture; if it comes during the growing season, it makes it easier to grow crops.

b. Precipitation is important to agriculture; if it comes during the growing season, it makes it easier to grow crops.

1) Precipitation is important to agriculture; if it comes during the growing season, it makes it easier to grow crops.

2) Precipitation is important to agriculture; if it comes during the growing season, it makes it easier to grow crops.

- b. Precipitation and moisture patterns differ widely, ranging from almost no rainfall to rainfall of over 110 inches a year on the average.
- 1) Precipitation may come in the form of snow, soft. gentle rains, or downpours; the type of precipitation is important.
 - 2) Precipitation may be uneven from one month to another; the time when it occurs may be important for vegetation and crops.

Plot the hourly temperature readings for your community 24 hour period on a line graph. This data is available in newspapers or the local weather station. The purpose of this activity is not only to provide experience in graphing but more important, to illustrate the great temperature range. Next the question should be raised as to why there is a temperature range.

You may wish to show the filmstrip Weather Maps to teach how to read such maps. You may also wish to use the large weather bureau maps of the U.S.

49. Say: We usually read weather predictions or look at weather maps because we are interested in whether there will be precipitation. It can be as important as temperature.

Show pupils an average annual precipitation map of the U.S. Ask: What must be included when figuring precipitation? Is an inch of snow equal an inch of rain? What else would you want to know about an area besides the precipitation in order to decide if there is enough moisture to grow certain kinds of crops? Ask further questions to help pupils understand the need for precipitation at certain times of year. (e.g. In the spring, which would be more useful for growing crops, rain or snow during the growing season or precipitation from November to March?)

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eat temperature range.
s to why there is a temper-

Weather Maps to teach pupils
wish to use the large

Filmstrip:
Weather Maps,
Curriculum Ma-
terials Corp.
U.S.; Weather
Bureau maps of
U.S.

tions or look at weather
ether there will be any
nt as temperature.

tation map of the U.S.
uring precipitation? Does
n? What else would you
ne precipitation in order
e to grow certain kinds of
pupils understand the
mes of year. (e.g. In gen-
growing crops, rainfall
tation from November to

Plate 13 in In-
formative Class-
room Picture
Set on The South.

S. Interprets map symbols (color layers) in terms of map legend.

G. Unevenly distributed phenomena form distinctive patterns on the map.

G. Warm air can hold more water than cool air; therefore, warm air picks up moisture and the cooling of air leads to precipitation.

G. If precipitation comes mainly at the hottest time of the year, more is needed than during cool weather to provide an equal amount of moisture.

G. The land in hot regions evaporates quickly as the warm air picks up moisture; therefore, more rain is needed to grow crops in these regions than in regions which are not so hot.

S. Gains information by conducting simple experiments.

3) Precipitation means little unless one also considers evaporation; moisture patterns indicate the effective precipitation after evaporation has been considered.

50. Show pupils the moisture map in Borchert. Have them examine the map legend. Then ask: How does this map differ from the precipitation map? Note particularly differences in where lines are drawn in the great plains area. Why do you think they may differ? Can you think of any factor which we have not considered so far in our discussion of moisture? Use one or more of the following activities to help pupils understand evaporation and differences in the rate of evaporation in different temperature areas and at different times of year.

Borchert and M
Guigan, Geog.
the New World,
p. 21.

a. Ask pupils to think of times when they have seen the sun come out after a shower during the middle of the day. What happens to the pavement? (Can see steam rising as pavement dries out.) Relate idea to evaporation.

b. Fill two pans of the same size with the same amount of water. Place one on the radiator in the room and one across the room from the radiator and on the floor. Have pupils keep a record of how long it takes for the water to disappear in each pan. Then ask: Since the water was not brought to a boil, why did the water disappear? Why do you think the water on the radiator disappeared first? (Perhaps also put a pan in the school basement or some other much cooler spot and have pupils compare temperatures in all three places as well as speed of evaporation.)

Two or three p
of the same si

c. Dip a piece of glass in cold water and dry quickly, or place it in a refrigerator for a time. Now ask a child to blow onto it. What happens? (Help children to understand how warm air loses moisture when it is cooled.)

51. Now ask: Which map is more useful for us to use in looking at agricultural possibilities: the precipitation map or the moisture map? Why?

-61-

in Borchert. Have them examine the map and see how it differs from the precipitation map. (Notice the differences in where lines are drawn. Why do you think they may differ? Which we have not considered so far. Use one or more of the following to understand evaporation and differences in different temperature areas and at

Borchert and Mc-
Guigan, Geog. of
the New World,
p. 21.

times when they have seen the sun come to the middle of the day. What happens to the steam rising as pavement dries out.)

size with the same amount of water. Put one in the room and one across the room on the floor. Have pupils keep a record of the water to disappear in each pan. If it was not brought to a boil, why did it not? do you think the water on the radiator? (Perhaps also put a pan in the other much cooler spot and have pupils compare the three places as well as speed of

Two or three pans
of the same size.

old water and dry quickly, or place a time. Now ask a child to blow onto the water. Have children to understand how warm air is cooled.)

useful for us to use in looking at the precipitation map or the mois-

S. Gains information by studying pictures.

S. Gains information by studying pictures.

G. Deserts have very little rain and precipitation is very irregular from one year to another.

S. Applies previously-learned concepts and generalizations to new data.

S. Sets up hypotheses.

G. Winds which have picked up moisture crossing large bodies of warm water tend to cool as they rise over mountains and so drop their water on the side of the mountain from which they come.

4) Precipitation close to the current

- 4) Precipitation is affected by the direction of the wind, physical barriers, closeness to warm water bodies, ocean currents, etc.

52. Prepare a bulletin board display focusing on pictures of landscapes which indicate a lack of moisture contrasted with those of normal moisture. (If pictures are not available for the bulletin board, text pictures can be substituted.) Ask: Do you think this area gets a great deal of water (moisture) or very little water? What are some of the signs of lack of moisture in these pictures? (clear sky -- lack of water vapor; brown vegetation or lack of vegetation; lack of trees; blowing dust; type of crops grown) Also ask: Where do you think these places are which are shown in these pictures? (Locate on a map.)
53. Project pictures of different desert areas, showing some with almost no vegetation, some with sagebrush, some with bunch grass, etc. How can pupils tell from these pictures which area has less moisture?
54. Assign the task of locating at least four different pictures of U.S. (preferably colored) in any book or magazine which express some of the evidences of an arid area. Assign the task of locating at least four different pictures (preferably colored) in any book or magazine which express some of the evidences of moisture. Organize the children into groups of two or three and have them display their choices and discuss the differences between wet and dry areas. Be sure they locate the places on a physical map of the United States.
55. Have pupils compare the moisture map with a physical relief map. Let them note the pattern of moisture in the U.S. Remind pupils of the westerly winds on the coast. Why would the coastal area get more rain than the land beyond the mountains? Let pupils speculate and then use a diagram to illustrate the reason.

display focusing on pictures of landscape of moisture contrasted with those of pictures are not available for the bulletin be substituted.) Ask: Do you think all of water (moisture) or very little the signs of lack of moisture in these lack of water vapor; brown vegetation lack of trees; blowing dust; type of crops do you think these places are which are (Locate on a map.)

different desert areas, showing some with all with sagebrush, some with bunch grass, from these pictures which area has less

Get at least four different pictures of in any book or magazine which express an arid area. Assign the task of locating pictures (preferably colored) in express some of the evidences of moisture into groups of two or three and have and discuss the differences between and they locate the places on a physical

moisture map with a physical relief map of moisture in the U.S. Remind pupils the coast. Why would the coastal area be beyond the mountains? Let pupils diagram to illustrate the reason.

See back issues of National Geographic and Arizona Highways.

Filmstrip: Life in the Desert, E.B.F. Curriculum Color Prints. Knight, First Book of Deserts.

Physical map of U.S.

Life Editors. Weather, p. 98 shows diagram.

- G. As winds descend into valleys from mountain ridges, they are warmed and tend to pick up moisture.
- S. Sets up hypotheses.
- S. Applies previously-learned concepts and generalizations to new data.
- G. Winds which cross cold water currents are cooled and will pick up moisture rather than dropping it as they cross land areas which are warmer than the water.
- A. IS SCEPTICAL OF THE FINALITY OF KNOWLEDGE; CONSIDERS GENERALIZATIONS AND THEORIES AS TENTATIVE, ALWAYS SUBJECT TO CHANGE IN THE LIGHT OF NEW EVIDENCE.
- A. RESPECTS EVIDENCE EVEN WHEN IT CONTRADICTS PRECONCEPTIONS.
- S. Applies previously-learned concepts and generalizations to new data.

56. Now have pupils examine the moisture map for the west coast. What differences do they note between the southern part of the coast and the northern part? Let them look at rainfall maps for winter and summer. What differences are there for these two regions? Since both areas are by the ocean, what might account for the differences? Let pupils set up hypotheses and then show them a map of ocean currents and prevailing winds. Ask: Where does this current come from? Would the water there be warm or cold? Since the water does not change temperature very rapidly, would the water be warmer or colder than water off the southern part of the west coast? What would happen to the winds blowing over the current in the direction of the mainland? Since these winds are cooled by the ocean current, would they pick up much water in the form of evaporation? What would happen when these cool winds come to the land area along the outer coast? Would they drop water or pick up moisture as they warm up over the land area? What would happen to rainfall on this part of the coast? etc. Would there be any difference in rainfall in winter and in summer months? Why? When would you expect there to be the most rainfall along the southern coast? Now have pupils check maps of winter and spring precipitation to check on their guesses.
57. You may wish to show the film Life in Mediterranean Lands (California) which shows both the causes of the Mediterranean climate in Southern California and the way in which people live there.
58. Now ask: Where do you think the upper Midwest (point out) gets its moisture from? (If necessary show them on the map.) Then ask: Why does Minnesota get less moisture than the states to

the moisture map for the west coast. What between the southern part of the coast. Let them look at rainfall maps for winter. Are there for these two regions? In the ocean, what might account for the difference? Set up hypotheses and then show them a map of prevailing winds. Ask: Where does this come from? Is the water there be warm or cold? Since the temperature very rapidly, would the air be warmer than water off the southern part of the coast? What happens to the winds blowing over the coast? The mainland? Since these winds are moist, would they pick up much water in the ocean? What would happen when these cool winds come ashore along the outer coast? Would they drop their moisture as they warms up over the land area? What happens on this part of the coast? etc. Would there be more rainfall in winter and in summer months? Expect there to be the most rainfall along the coast. Have the pupils check maps of winter and spring rainfall and compare with their guesses.

film Life in Mediterranean Lands (California) the causes of the Mediterranean climate and the way in which people live there.

Think the upper Midwest (point out) gets less moisture. Have necessary show them on the map.) Then have them get less moisture than the states to the west.

Borchert and McGuigan, Geography of the New World, p. 21, Map of U.S. with acetate overlay showing prevailing winds and ocean currents along Pacific coast.

Film: Life in Mediterranean Lands (California), 11 min., Coronet.

Physical map of U.S.

S. Sets up hypotheses.

S. Applies previously-learned concepts and generalizations to new data.

G. Water is evaporated from the oceans, is carried in clouds, by the wind, is dropped on land areas through precipitation, and is then evaporated once more or runs off by way of rivers and underground streams to the oceans.

G. If lakes have no outlets, they are likely to develop into salt-water lakes or dry up into salt beds.

S. Sets up hypotheses.

G. Differences in air temperature lead to movements of air and winds. As warm air rises, cooler air moves in to replace it.

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- 5) Moisture comes from the warm oceans and other large bodies of warm water and is transported by winds in cloud form, is dropped in the form of precipitation, and most of it evaporates or returns to the oceans by way of run-off from the land; the United States is drained by many rivers and different drainage systems.

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salt-
salt

- 6) Some water drains into lakes which have no outlet; evaporation eventually develops these lakes into salt water bodies or dries them up and turns them into salt beds.

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cooler
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- 7) Precipitation is affected by sun-earth relationships because they create prevailing winds and ocean currents.

the south of Minnesota? Why doesn't it get much moisture from the Great Lakes? What would happen to winds blowing across the Great Lakes? Would they pick up much moisture? Why or why not?

59. At this point it might be wise to stop and discuss the hydrological cycle. Pupils have learned that warm air picks up moisture and that when the air cools, it drops the moisture in the form of precipitation. Ask: What happens to the water or snow after it is dropped? Since most of our precipitation comes from the moisture picked up from the oceans, why don't the oceans dry up? Let pupils speculate about what happens to the precipitation. Perhaps ask questions about what they have seen happening after a big rainfall or when snow melts in the spring (e.g. water running into drains; high water in rivers; floods; etc.) What else have they learned about what happens to some of the precipitation in very dry areas? (evaporated). Is it only in very dry areas that water is evaporated into the air? (Relate to need to keep watering plants in house and to what pupils know about plants.) Now show pupils a diagram which illustrates the hydrological cycle. Perhaps prepare a simplified version of the diagram in Meyer. Or you may wish to show the film The Water Cycle.
60. Tell the class that in some places water drains into inland lakes which have no outlets. Locate the Great Salt Lake. Why might it have no outlet? Call attention to its name and describe briefly why the water becomes salty. Perhaps also show some of places in Nevada where small bodies of such water collect and dry out and become sources for salt.
61. Remind pupils that they have learned that both prevailing winds and ocean currents affect climate. Then tell them that these features are caused by the rotation of the earth and its revolution around the sun. Let pupils guess about ways in which these movements might affect winds and currents. Then use several activities such as the following to help pupil understand these effects:

Isn't it get much moisture from
open to winds blowing across the
much moisture? Why or why not?

to stop and discuss the hydrolog-
that warm air picks up moisture
drops the moisture in the form of
ns to the water or snow after it
precipitation comes from the mois-
why don't the oceans dry up? Let
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ey have seen happening after a
in the spring (e.g. water running
s; floods; etc.) What else have
to some of the precipitation in
s it only in very dry areas that
? (Relate to need to keep water-
pupils know about plants.) Now
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e Water Cycle.

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the Great Salt Lake. Why might it
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perhaps also show some of places in
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guess about ways in which these
d currents. Then use several ac-
to help pupil understand these ef-

Meyer and Strietel-
meier, Geography
in World Society, p.
186.

Film: The Water Cycle,
11 min., E.B.F.

Map of U.S. and
large-scale maps
of Utah.

Pictures of salt
areas of Nevada,

- G. The direction of prevailing winds is caused both directly and indirectly by the rotation of the earth and its revolution around the sun.
- G. The ocean currents are caused largely by the direction of prevailing winds and the rotation of the earth.
- S. Gains information by observing the world around him.
- S. Gains information by conducting simple experiments.
- A. IS SCEPTICAL OF THE FINALITY OF KNOWLEDGE: CONSIDERS GENERALIZATIONS AND THEORIES AS TENTATIVE, ALWAYS SUBJECT TO CHANGE IN THE LIGHT OF NEW EVIDENCE.

- a. Ask them to think about what seems to be happening to air close to a hot air outlet or a radiator? (It is rising.) Where is air cooler -- on floors or higher up in a room? (Perhaps let pupils use thermometers to check on their statements.) Point out that some air may be entering a room through cracks in windows in which air circulates in room.
 - b. Use a smoke chimney (as suggested in books on teaching elementary science) or charts which illustrate the way in which warm and cold air moves.
 - c. Now ask: In what parts of the world would the air be hot or colder? What would happen as a result of these differences? Use a diagram to explain if necessary. Then use some of the diagrams and pictures in The World We Live In to explain the effects of differences in temperature and the rotation of the earth upon wind directions.
 - d. Now ask: When wind blows over a body of water, what happens to the water? (Ask children to think of what they have seen on rivers and lakes.) Perhaps have a child blow hard on water in a pan of water or start a fan blowing on water in a large tub of water. Put a toothpick into the water so that children can see how the water moves. Then use diagrams and pictures to illustrate how the ocean currents are affected by the prevailing winds, although they are deflected somewhat by the rotation of the earth.
62. Review use of maps and introduce affects of climate by showing Maps And Their Meaning. The meaning of the different colors on a physical map is explained and visualized. The colors are used on the map to represent different land and water areas. The

ms to be happening to air
radiator? (It is rising.)
or higher up in a room?
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e air may be entering a
n which air circulates in a

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ssary. Then use some of the
ld We Live In to explain the
ature and the rotation of the

Life Editorial Staff,
The World We Live In,
pp. 74-75.

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a child blow hard on water in
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s are affected by the prevail-
lected somewhat by the rotation

Life Editorial Staff,
The World We Live In,
31-32.
Pan of water.

fects of climate by showing:
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ualized. The colors are used
and and water areas. The

Film: Maps and
Their Meaning, 1½
reels, Academy.

S. Uses simple statistical device of mean (average) to analyze data, but recognizes that it does not reveal the range and variation in data.

S. Classifies data.

Understands concept of climate.

A. IS SCEPTICAL OF THEORIES OF SINGLE CAUSATION.

G. The rotation and inclination of the earth and the revolution of the earth around the sun has a number of effects upon climate.

G. Precipitation is affected by factors such as distance from bodies of warm water, wind direction, temperature, ocean currents, and physical features which force winds to rise.

G. Temperature is affected by such factors as distance from the equator, elevation, distance from warm water bodies, prevailing winds, and physical features which block winds from certain directions.

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- c. Climate varies widely from one part of the country to another; it results from different combinations of precipitation humidity, and temperature. Weather deals with daily changes in the atmosphere; climate deals with averages or typical weather conditions.

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film shows the types of land found in each of the color zones. It shows how man uses the land in each color zone. It also explains the important effects of altitude, latitude and rainfall.

63. Say: We have been talking about differences in precipitation and temperature around the country. What do you think we mean by climate? Are we referring only to temperature? to moisture? How does climate differ from weather? (Explain that climate is dealing with average weather conditions.)

Now have pupils compare precipitation and temperature maps of the U.S. to identify places with different combinations of temperatures and precipitation. (e.g. Places which are cold in winter and cool in summer and relatively wet; places which are warm in winter and cool in summer and relatively wet, etc.) Perhaps have pupils develop their own categories of possible combination of conditions as they examine the maps. Have them prepare maps to illustrate these conditions. Then they might compare their maps and categories with those developed by geographers. (Use a simplified classification system used by geographers.)

Pupils should be able to note that climate can differ considerably even within one state. Let pupils who have travelled much in Minnesota describe differences between northern and southern Minnesota to note climatic differences within this one state.

Have pupils summarize the factors affecting climate, as they have studied them so far.

land found in each of the color zones.
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 fects of altitude, latitude and rainfall.

ing about differences in precipitation
 the country. What do you think we mean
 erring only to temperature? to moisture?
 from weather? (Explain that climate
 weather conditions.)

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 aces with different combinations of tem-
 tion. (e.g. Places which are cold in
 er and relatively wet; places which are
 in summer and relatively wet, etc.) Per-
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 ification system used by geographers.)

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 ate. Let pupils who have travelled much
 differences between northern and southern
 tic differences within this one state.

he factors affecting climate, as they have

Precipitation and
 temperature maps
 mentioned above.

Climate map (e.g.
 map transparency
 from Nystrom).

G. Man changes the character of the earth.

d. Man affects climate.

A. IS CURIOUS ABOUT SOCIAL DATA.

A. IS SCEPTICAL OF THE FINALITY OF KNOWLEDGE; CONSIDERS GENERALIZATIONS AND THEORIES AS TENTATIVE, ALWAYS SUBJECT TO CHANGE IN THE LIGHT OF NEW EVIDENCE.

G. Vegetation is affected by temperature and precipitation.

4. Vegetation is affected by climate.

S. Sets up hypotheses.

S. Applies previously-learned concepts and generalizations to new data.

64. Ask: Can you think of any ways in which man has or can modify climate (either temperature or precipitation or both)? Some pupils may have heard about seeding rain clouds. However, they probably have not thought about ways in which man has modified climate in other ways. You might like to use some of the following examples to illustrate them.
- a. Tell the class that Chicago's frost-free season is 197 days as compared to 167 days for surrounding counties. How might they account for this? If pupils have spent vacations in rural areas during the summertime, ask them how temperatures at night differ from temperatures in cities at night? (Analyze effect of pavement and cement in holding and throwing off heat.)
 - b. Ask: What might be the effect of covering so much of an area with pavement and buildings upon moisture in the area? (Moisture will run off, more so than in rural areas where it can soak in better). What might be the effect of having less grass and fewer trees than in rural areas (less evaporation). What might be the effect of all of the smoke in the air? -- (decrease light and particularly certain kinds of light -- ultraviolet light). Smoke affects precipitation.
 - c. Tell the class Bryson's description of effects of dust in the air and his hypotheses about the creation of a desert in the sub-continent.
65. Now ask: How do you think climate might affect natural vegetation in an area? Let pupils make guesses. Remind them of the pictures they examined on moisture. How did moisture affect vegetation? Is vegetation affected only by moisture? How does temperature affect it? Show pupils pictures of vegetation in the tundra in the Rocky Mountains where there is plenty of moisture. (If possible use pictures which show snow in the area to illustrate the moisture.) Ask: Why are these flowers so small? Why do you think there aren't any trees in the picture? If

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e pictures which show snow in the area to
e.) Ask: Why are these flowers so small?
aren't any trees in the picture? If

For examples of
effects of man
upon climate, see
Reid Bryson, "Is
Man Changing the
Climate of Earth?",
Saturday Review of
Literature, April
1, 1967, pp. 52-55.

- G. Trees need more water than long grasses in order to grow; long grasses need more water than short grasses.
- G. Grass will grow in some areas which are too cold for trees.
- S. Draws inferences from a comparison of different map patterns of the same area.
- S. Tests hypotheses against data.
- A. SEARCHES FOR EVIDENCE TO DIS-PROVE HYPOTHESES, NOT JUST TO PROVE THEM.
- G. Vegetation is affected in part by temperature and precipitation.
- G. Vegetation and what can be grown is affected in part by soil.
- S. Gains information by conducting simple experiments.
- G. Vegetation and what can be grown is affected in part by soil.

5. Soils affect vegetation can be grown and in turn vegetation and crops are affected by rock from which they are derived and by wind, water, and

a. Soils affect vegetation grown.

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5. Soils affect vegetation and the crops which can be grown and in turn are affected by vegetation and crops as well as by the basic rock from which they are formed, by climate, and by wind, water, and glacial action.

conducting

- a. Soils affect vegetation and what can be grown.

an be grown
by soil.

pupils have come through the Center's primary grades, as what they learned about vegetation in the high mountains of Peru when they studied the Quechua. Have pupils suggest possible types of natural vegetation for different parts of the country.

66. Have pupils compare a map of natural vegetation in this country with maps of temperature and precipitation and check their hypotheses about vegetation against the data on the map.
67. View and discuss the filmstrip; Green Lands. This filmstrip illustrates various types of vegetation from high to low altitudes and along the fortieth parallel to show environmental factors such as growing season, rainfall, altitude and soil on living conditions.
68. Show pupils two pictures in the dairy region of southern Wisconsin, one of which shows good farm land and one of which shows poor land for farming. Point out that the climate and soil are just about the same. What can they tell about the differences? Are they the same or different? How can pupils account for differences in the farms then? (Soil)
69. Obtain samples of the major soil types of the United States by contacting the Department of Agronomy in the appropriate Universities. An interesting display could be made of soil specimens and the youngsters could observe first hand the

ough the Center's primary grades, ask them
out vegetation in the high mountains of
ed the Quechua. Have pupils suggest possi-
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a map of natural vegetation in this country
ture and precipitation and check their hy-
ation against the data on the map.

Map of natural veg-
etation in U.S.
(e.g. Transparency
from Nystrom Co.)

filmstrip; Green Lands. This filmstrip
types of vegetation from high to low lati-
fortieth parallel to show environmental
ing season, rainfall, altitude and latitude

Filmstrip: Green
Lands, Society for
Visual Education.

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ows good farm land and one of which shows
g. Point out that the climate and elevation
ame. What can they tell about the landforms?
different? How can pupils account for the
arms then? (Soil)

Kohn and Drummond,
The World Today,
p. 66.

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ment of Agronomy in the appropriate State
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ungsters could observe first hand the varia-

- S. Draw inferences from a comparison of different map patterns of the same area.
- G. Soil in a particular place is affected by the type of basic rock in the region, the climate, vegetation, erosion, wind, glaciers, and rivers which move soil.
- S. Sets up hypotheses.
- G. Nature changes the character of the earth through biotic processes.
- G. Man changes the character of the earth.
- G. Erosion of soil results from water and wind; it is more likely in areas where grass
- b. Soils are affected by vegetation and by climate.
- c. Soils are affected by the basic rock in the region, and by erosion.
- d. Man affects soils.

tions in color and texture, also the effects of weathering and leaching can be readily noted. Make a map to show where soils come from.

Place portions of each of the above samples of soil in small m cartons. Plant several kinds of seeds in each box. Is there variation in the growth of the seeds? What caused it? NOTE: Try to be as scientific as possible. Be sure that each box receives equal sunshine and moisture.

70. After pupils have examined different kinds of soils, show them more complete soils map, a vegetation map, and a climatic map. What relationships do they see between climate and vegetation? Between vegetation and soils? Between rainfall and soils? Let pupils set up some hypotheses.
71. Review what pupils learned earlier, when studying how landforms were created, about the way in which water, wind, and glaciers move rocks and soil and about how soil is made. Perhaps show the film Birth of Soil or What is Soil? If necessary, read aloud or tell children additional information about effect of vegetation and climate on soil.
72. Show a filmstrip which illustrates how man affects soils, both by making erosion easier and by farming practices which exhaust it.

to the effects of weathering and
Make a map to show where soils

obtain samples of soil in small milk
cans with seeds in each box. Is there a
relationship between seeds? What caused it? NOTE:
Be sure that each box re-
quires.

different kinds of soils, show them a
vegetation map, and a climatic map.
relationship between climate and vegetation?
relationship between rainfall and soils? Let

Soils map of U.S.
(e.g. Deasy, et.al.,
The World's Nations,
p. 44, Goodes Atlas.)
Vegetation-climatic
maps (e.g. Nystrom
transparencies.)

Soil, when studying how landforms
which water, wind, and glaciers
how soil is made. Perhaps show
What is Soil? If necessary, read a-
bout information about effect of

Films: Birth of
Soil, What is Soil?
E.B.F.

How does man affect soils, both
farming practices which exhaust

Filmstrips: Soil Re-
sources, Curriculum
Materials Corp.;
Saving Our Soil,
E.B.F.

and trees have been removed.

V. United States Geogr
studying only phys
many ways in which
cal environment.

G. Political boundaries are man-
made and frequently do not fol-
low any natural physical bound-
aries.

A. Political bounda
quently they do
boundaries.

S. Draws inferences from a compari-
son of different map patterns of
the same area.

S. Sets up hypotheses.

B. Men's agricultu
by but not dete

V. United States Geography cannot be understood by studying only physical features; we must study the many ways in which man uses and modifies the physical environment.

A. Political boundaries are drawn by man; frequently they do not coincide with any natural boundaries.

B. Men's agricultural activities are affected by but not determined by physical features.

73. Say: We have seen several instances already of how man has modified physical features of the countryside. What others can you think of offhand? (List on chart.) Say: We will try to add to this list as we continue to study the United States. We also need to study how man lives in different parts of the country and different states if we are to understand what these places are like.
74. Point out to the class that pupils have frequently referred to states and that earlier they referred to countries which border on the U.S. Show the class a political map of the United States which shows state boundary lines and boundaries with Canada and Mexico. Have them identify the symbols used to show these boundaries. Then ask: From what you already know, do you think many of these boundary lines follow natural boundary lines of some kind? Compare the map with a physical map and with climatic maps. Where do some of the boundaries of physical features coincide? Do they generally coincide or do these man-made boundaries cut across natural boundaries? Perhaps show pupils pictures of state borders or even the border with Canada where no natural boundary line can be seen.

Ask: Since political boundary lines between states and countries frequently do not follow any natural boundary lines, why are they important?

75. Say: We have examined climatic maps, soil maps, and landform maps. Do you think there would be any relationship between landform, climate, soil and agriculture in this country? Do you think the physical features will determine where man farms and what and how he farms in a particular place? Why? Let pupils set up hypotheses about these relationships, suggest types of farming which might be expected in certain parts of the country and identify places where they do not expect to find any agriculture.

stances already of how man has modified countryside. What others can you do? (art.) Say: We will try to add to our study the United States. We also need to study different parts of the country and understand what these places are like.

Pupils have frequently referred to the United States as a country which bordered other countries. Show a political map of the United States and boundaries with Canada and Mexico. What symbols used to show these boundaries? What do you already know, do you think you can follow natural boundary lines of the United States with a physical map and with climate? Do the boundaries of physical features coincide or do these man-made boundaries? Perhaps show pupils pictures of the border with Canada where no boundary is seen.

Why are lines between states and countries natural boundary lines, why are they not?

What is the relationship between land and agriculture in this country? Do you think you will determine where man farms and in what particular place? Why? Let pupils suggest types of relationships, suggest types of land found in certain parts of the country, why do not expect to find any agri-

Map of United States showing political boundaries.

Relief map of U.S.

Climatic map of U.S.

(For sources, see earlier references above.)

For pictures see Nystrom's Map Symbols and Geographic Terms Charts or make your own slides.

G. Different crops need differing amounts of rainfall and differing temperatures and number of frost-free days in order to grow; moreover, they need water and dryness at different times during their period of growth.

G. Man changes the character of the earth. (Irrigation makes it possible to grow crops on land which otherwise would be too dry.)

S. Tests hypotheses against data.

G. Man uses his physical environment in terms of his cultural values, perceptions, and level of technology.

A. SEARCHES FOR EVIDENCE TO DIS-
PROVE HYPOTHESES, NOT JUST TO
PROVE THEM.

A. RESPECTS EVIDENCE EVEN WHEN IT
CONTRADICTS PRECONCEPTIONS.

S. Sets up hypotheses.

G. Machinery and power make possible greater production per person.

2. The val
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2. The value of land tends to be related to a number of factors such as moisture, soil, temperature and growing season, population densities, and transportation facilities.

76. Now have pupils examine maps of different types of agriculture in the U.S., including one which shows major types of farming activities as well as a series of maps showing different kinds of crops and animal production. Compare these once more with maps of climate, soil, and landforms. What relationships do they see? Were their guesses correct about where agriculture would and would not be found and about types of farming activity? Probably many pupils guessed that there would be little agriculture in desert areas in the southwest. Show them pictures of some of the rich agricultural areas there where irrigation is used to make crops possible. Have natural features determined where people farm?
77. Say: Let's look now at some other possible relationships between physical features of areas and agriculture. After ascertaining that the youngsters are aware of the size of an acre of land, have the pupils examine the "Number and Acreage of Farms" chart. What is happening to the number of farms? Why? What is happening to the size of farms? Census figures reveal that there is a decline in the number of farmers too. Discuss: How is it possible for fewer farmers to take care of more land? (Emphasize

aps of different types of agriculture
e which shows major types of farming
eries of maps showing different kinds
ction. Compare these once more with
d landforms. What relationships do they
correct about where agriculture would
d about types of farming activity? Prob-
that there would be little agriculture in
west. Show them pictures of some of the
here where irrigation is used to make
ural features determined where people

e.g. Map of Agri-
cultural Regions
from folder of pic-
tures on The South,
Informative Class-
room Pictures Publi-
cations, plate 16.
Series of maps in
Goode's School Atlas.
Series of maps in
Deasy, et.al., The
World's Nations, pp.
47, 51.

Map of agricultural
regions in Finch et.
al., Earth and Its
Resources, p. 479.

Maps of Climate,
soil, and landforms,
(see above).

Pictures in old is-
sues of Arizona High-
ways; in U.S. Depart-
ment of Interior,
Natural Resources of
Nevada; National Geo-
graphic, March, 1963,
pp. 316-317.

ome other possible relationships between
s and agriculture. After ascertaining
ware of the size of an acre of land,
he "Number and Acreage of Farms" chart.
number of farms? Why? What is happen-
Census figures reveal that there is
farmers too. Discuss: How is it pos-
to take care of more land? (Emphasize

See chart in appen-
dix.

Pictures such as
those on pp. 31, 39,
42, 44 of McLaughlin
and Editors of Time-
Life Books, The Heart-
Land. Or see Informa-

- S. Sets up hypotheses.
- S. Figures out ways of testing hypotheses.
- A. IS CURIOUS ABOUT SOCIAL DATA.

- S. Draws inferences from a comparison of different map patterns of the same area.
- S. Test hypothesis against data.

the great mechanization of farms and show pictures to illustrate.)

Note the great increases in land values for some of the states since 1950. Why? It is possible to prepare hypotheses to be tested by the data presented in the chart. If the chart appears too complex for a given class, use selected states for discussion, such as Minnesota, New Jersey and Arizona.

78. Say: Suppose geographers have an hypotheses that the average size of farms is related to land values. You be geographers and try to think what relationships might exist. How could you test your hypotheses given the data on these charts? (Make maps). Have pupils make two maps, one of average farm size and one of land values and compare them. You might follow the procedures below:
 - a. A committee or all members of the class might map the variation in average acreage of farms in the U.S. The data for this map is presented in the chart on "Number and Acreage of Farms." (These maps can be used in later units when studying each of the regions.) The following key should aid in adequately presenting the variation: under 100 acres; 101-150; 151-200; 201-250; 251-350; 351-500; 501-750; 751-1500; over 1500 acres.
 - b. A committee or all members of the class might map the variation in the value of land in the United States. The data needed for this map is presented in the chart on "Number and Acreage of Farms." These maps should be used when studying each of the regions. The following key should aid in adequately presenting the variation in land values: under \$50 per acre; \$50-\$100; \$101-\$150; \$151-\$200; \$201-\$250; \$251-\$300; \$301-\$350; over \$350.
 - c. Have pupils compare the two maps which they have just made on farm size and land values. They should locate the states with the highest land values and the lowest land values and notice farm sizes in these states. Ask: Were your guesses right or wrong?

of farms and show pictures to illustrate.)
 in land values for some of the states
 possible to prepare hypotheses to be
 nted in the chart. If the chart appears
 class, use selected states for discus-
 New Jersey and Arizona.

s have an hypotheses that the average
 to land values. You be geographers and
 onships might exist. How could you test
 e data on these charts? (Make maps).
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mbers of the class might map the varia-
 ge of farms in the U.S. The data for
 in the chart on "Number and Acreage
 ps can be used in later units when study-
 ns.) The following key should aid in
 the variation: under 100 acres; 101-150;
 151-350; 351-500; 501-750; 751-1500; over

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 \$101-\$200; \$201-\$250; \$251-\$300; \$301-\$350; over

ne two maps which they have just made on
 ues. They should locate the states with
 es and the lowest land values and notice
 ates. Ask: Were your guesses right or

tive Classroom Pic-
 ture set on South,
 plates 17 and 36
 which show 2 ways
 of picking cotton.

- S. Uses scatter diagram to test hypotheses.
- A. RESPECTS EVIDENCE EVEN WHEN IT CONTRADICTS PRECONCEPTIONS.

- S. Sets up hypotheses.
- S. Figures out ways of testing hypotheses.
- S. Draws inferences from a comparison of different map patterns of the same area.

79. Now point out that geographers have another tool for identifying relationships which may even be easier to use on certain kinds of data when one is interested in a relationship rather than in noting specific areas of the country. It is called a scatter diagram. Draw the axis for such a diagram on the chalkboard, put in the appropriate scales, and then plot the points for the first three states, making sure that pupils understand how such diagrams are made.

Now begin a new diagram with the vertical and horizontal scales marked. Ask: Suppose land values are always higher when the average size of farms is larger and lower when the average size of farms is smaller. Where would we find the dots placed on this map? Let pupils make suggestions and then plot an imaginary scatter diagram which would fit such a situation. (Provide some variation from a straight line, but let the dots cluster around the line which can be drawn through them to show the close correlation of this kind.) Now plot another imaginary scatter diagram to illustrate what one would look like if land values were always higher when the average size of farms is smaller and lower when the average size of farms is higher. (Again draw in a line through the dots to show how the dots cluster around a straight line.)

Now have each pupil use graph paper to plot his own scatter diagram for the data presented for each state in 1960. Then ask: Can you draw a line through these dots so that most dots lie close to it? Does your scatter diagram resemble either of our model diagrams? What does your scatter diagram tell you about the relationship of farm size to farm values?

80. Now ask: Can you think of any other factors which might affect farm values? Let pupils suggest hypotheses and ways of testing them. As usual record them on the chalkboard. Then do the following or similar activities, checking the list of hypotheses and adding to them.

Geographers have another tool for identifying relationships which may even be easier to use on certain kinds of data than in notes of the country. It is called a scatter diagram. For such a diagram on the chalkboard, put two scales, and then plot the points for the first time, making sure that pupils understand how such diagrams

are made. Draw a diagram with the vertical and horizontal scales. Suppose land values are always higher when the average size of farms is larger and lower when the average size of farms is smaller. Where would we find the dots placed on this diagram? Make suggestions and then plot an imaginary scatter diagram which would fit such a situation. (Provide some straight line, but let the dots cluster around it. A line can be drawn through them to show the close correspondence.) Now plot another imaginary scatter diagram which would look like if land values were always higher when the average size of farms is smaller and lower when the average size of farms is higher. (Again draw in a line through the dots to show how the dots cluster around a straight line.)

Pupils will use graph paper to plot his own scatter diagram. Data is presented for each state in 1960. Then ask: How can you tell through these dots so that most dots lie on a straight line? Does your scatter diagram resemble either of our two? What does your scatter diagram tell you about the relationship of farm size to farm values?

Ask pupils to think of any other factors which might affect farm values. Pupils suggest hypotheses and ways of testing them. Record them on the chalkboard. Then do the following activities, checking the list of hypotheses.

For example of how to build a scatter diagram, see Broek, Geography, Its Scope and Spirit, pp. 60-62. Data on farm size and land values in Appendix.

- S. Tests hypotheses against data.
- A. SEARCHES FOR EVIDENCE TO DIS-
PROVE HYPOTHESES, NOT JUST TO
PROVE THEM.
- AI. IS SCEPTICAL OF THEORIES OF
SINGLE CAUSATION IN THE SOCIAL
SCIENCES.
- G. The value of land tends to be
related to a number of factors
such as moisture, soil, tempera-
ture and growing season, popu-
lation density, and transporta-
tion facilities.

- a. Have pupils compare the map of land values with the moisture map of the U.S. Ask: Does there seem to be any relationship between land values and moisture? Also have pupils compare the map of average farm size with the moisture map and look for possible relationships.
- b. Have pupils compare the map of land values with a map of growing seasons. Ask: Is there any relationship between length of growing season and land values?
- c. Have pupils compare the map of land values with a map of soil. Ask: Is there any relationship? If so, what? Would you expect farms to be smaller or larger in areas of poor soils? Use a Minnesota map to check hypotheses.

the map of land values with the moisture
Does there seem to be any relationship
and moisture? Also have pupils compare
farm size with the moisture map and look
ships.

the map of land values with a map of grow-
s there any relationship between length
land values?

the map of land values with a map of soils.
relationship? If so, what? Would you ex-
ler or larger in areas of poor soils? Why?
o check hypotheses.

Pupils' maps of land
values and farm sizes.
Moisture map in Bor-
chert and McGuigan,
Geography of the New
World, p. 21.

Pupils' map of land
values.
Map of Growing Season
(e.g. Borchert and
McGuigan, Geography
of the New World,
p. 24.

Pupils' maps of land
values.
Map of soils (e.g.
Deasy, et.al.,
World's Nations, p.
44.
Goodes World Atlas.

S. Uses simple statistical device of mean (average) to analyze data, but recognizes that it does not reveal the range and variations in data.

C. Population is not United States; the results from many ing and many shiftion patterns.

1. In 1960 there per square mile

Understands concept of square mile.

S. Gains information by making survey.

2. These people across the country

G. Large cities are characterized by a large number of people per square mile.

a. There are more in rural areas

C. Population is not distributed evenly across the United States; the uneven population pattern results from many factors. Population is growing and many shifts are taking place in population patterns.

1. In 1960 there was an average of 50 people per square mile in this country.

2. These people were distributed very unevenly across the country.

a. There are more people in urban areas than in rural areas.

- d. Compare a map of farm values with a map of population density. Is there any relationship? If so, what? How might you explain this relationship?
 - e. Set up a hypothetical situation in which pupils are on a horse-back trip into a wilderness area which can be reached only by horse trail. They discover some land with excellent physical features for growing crops. How valuable would this land be at the present time? Why? Let pupils set up hypotheses about the relationship of land values and transportation and check later during case studies.
81. Say: We have been looking at agricultural patterns in the U.S. Now we are going to look at where people live in this country and at what is happening to the number of people in the country.
- Tell the class that in 1960 there were 50 people per square mile in this country. What do pupils think this statement means? Review meaning of averages and use one or more of the following activities to teach pupils the meaning of square mile and density of population per square mile.
- a. Using a map of the local area, have pupils locate the school which they attend. Then mark off a square mile, either using the school as the center of the square or at one corner. Have pupils discuss all of the things which can be found within this square mile. Also have them figure out how far they would have to walk if they were to walk around the square mile.
 - b. If the school is in a town which has a fairly regular pattern of streets and avenues, you might take pupils on a bus trip. First drive around the border of the square mile. Have pupils count the number of blocks and keep a record of the number of

farm values with a map of population density.
relationship? If so, what? How might you ex-
plain?

Pupils' maps of farm
values.

Population Density
map (e.g. Informative
Classroom Pictures
set on Northeast,
plate 16.)

all situation in which pupils are on a horse-
back riding area which can be reached only by
discovering some land with excellent physical
features. How valuable would this land be
to you? Why? Let pupils set up hypotheses about
land values and transportation and check
their studies.

Looking at agricultural patterns in the U.S.
Look at where people live in this country
and try to find the number of people in the country.

In 1960 there were 50 people per square mile.
What do pupils think this statement means? Re-
search and use one or more of the following
to explain the meaning of square mile and density
per square mile.

In a local area, have pupils locate the school.
Then mark off a square mile, either using
the center of the square or at one corner. Have
pupils list the things which can be found within
the square mile. Also have them figure out how far they would
have to walk around the square mile.

In a town which has a fairly regular pattern
of streets, you might take pupils on a bus trip
around the border of the square mile. Have pupils
count the blocks and keep a record of the number of

Understands concept of population density.

- S. Uses simple statistical device of mean (average) to analyze data, but recognizes that it does not reveal the range and variations in data.

- S. Sets up hypotheses.

b. Population
a variety
by economic

- G. Population is distributed unevenly over the earth's surface many of the land areas are thinly populated.

- G. Men carry on more activities on plains than in hills and more in hills than in mountains except in the low latitudes.

- S. Interprets map symbols (color layers) in terms of map legend.

- S. Draws inferences from a comparison of different map patterns of the same area.

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ep patterns

- b. Population distribution is affected by a variety of physical factors as well as by economic activities in an area.

houses they see. Then drive up and down the blocks, so that the bus traverses all of the streets. Let pupils count the houses on these streets. How many houses were found in the square mile within their school area? If the number is more than 25 ask: Do you think that more than 50 people live in this square mile? Why?

- c. Use local census figures and the number of square miles within the local town and figure out the average number of people per square mile. Is it higher or lower than the average of 50 per square mile for the country as a whole? What might account for the difference?
 - d. Now tell pupils the population density for their state. Is it lower or higher than the population density in their square mile? In town areas it will be much smaller. In rural areas it will be larger. Ask: How can you explain the difference?
82. Ask: Do you think we will find more people in areas which are used largely for grazing or in areas used largely for dairy farming? Why? Do you think we will find more people in areas which are largely mountainous or areas which are largely level? In moist areas or dry areas? Why? What other factors do you think might affect where people live?

Show pupils the map of population density in Borchert. Ask them to read the key in order to interpret the map. Also show maps of landforms and of agricultural activities. Ask: Were your guesses correct? Show pupils picture of modern town built in desert because of climate. Ask: Why do you think people went to so much effort to build this town in this desert area?

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the streets. Let pupils count the
How many houses were found in the
school area? If the number is more
...nk that more than 50 people live in

...and the number of square miles with-
figure out the average number of people
higher or lower than the average of
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...lation density for their state. Is
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How can you explain the difference?

...find more people in areas which are
in areas used largely for dairy farm-
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...lation density in Borchert. Ask them
interpret the map. Also show maps
tural activities. Ask: Were your
ls picture of modern town built in
Ask: Why do you think people went
this town in this desert area?

Map of population
density using color
layers (See Borchert
and McGuigan, Geog-
raphy of the New
World, p. 17.
Maps of landforms
and agricultural
activities. See
above.
e.g. National Geo-
graphic, May, 1966,
pp. 616-617.

- G. Moist areas tend to have a higher population density than dry areas. However, population distribution reflects man's values and his technology as well as physical features of an area.
- G. Man changes the character of the earth.
- A. IS SCEPTICAL OF THEORIES OF SINGLE CAUSATION IN THE SOCIAL SCIENCES.
- G. Man uses his physical environment in terms of his cultural values, perceptions, and level of technology.
- G. A number of factors ---climate, surface features, natural resources, accessibility, and history -- affect settlement patterns.
- G. Unevenly distributed phenomena form distinctive patterns on the map.
- c. There are more people in some states than in others; for example, there were 350 people per square mile in New York in 1960, 42 in Minnesota, and 3 in Nevada.
- d. In general population densities are highest in the eastern third of the country and on the west coast and lowest in desert and high mountain regions.

83. Give pupils figures on population density in New York, Minnesota, and Nevada. How do they account for the difference?

84. Have pupils look again at the map of population distribution in Borchert. Have them generalize about patterns of distribution by asking such questions as: In what parts of the country do we find the largest number of people? The smallest number of people? Have pupils summarize some of reasons for settlement patterns.

- S. Interprets pictographs and bar graphs.
3. The population of this country has been growing rapidly but states are growing at different rates.
- S. Interprets pictographs and bar graphs.
- S. Draws inferences from a comparison of different map patterns of the same area.
- G. A number of factors -- climate, surface features, natural resources, accessibility, and history -- affect settlement patterns.
- G. ~~Large~~ cities are characterized by a large number of people per square mile.

85. Now have pupils compare the map in Borchert with either a map using dots to show population density or one which uses more color or hatching to show differences within states and urban concentrations. Ask: What does this map show which Borchert map does not show?
86. Show pupils a graph of population in the U.S. in 1930, 1950, and 1960. (Use a bar graph and a pictograph which use symbols of same size.) Perhaps show the pictograph first, then project a bar graph overlay over the pictograph to help pupils learn to read the bar graph.
87. Show pupils either: (a) a pictograph -- bar graph overlay showing the growth of population in selected states such as California, Minnesota, North Dakota, New York, and Arkansas or (b) two maps showing the population densities of the United States in 1930 and in 1960.
88. Have pupils look at a map of their own state and find out where the places are which have the heaviest population. They will find that the dot or more complicated map shows fairly clearly that the places most heavily populated are urban or city areas. Perhaps have pupils look at some of the pictures in Borchert which illustrate some of the features

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show differences within states and
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population in the U.S. in 1930, 1940,
bar graph and a pictograph which uses
perhaps show the pictograph first and
overlay over the pictograph to help
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the population densities of the United
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of their own state and find out
n have the heaviest population.
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aces most heavily populated are
haps have pupils look at some of the
n illustrate some of the features

Informative class-
room Picture set
on The Northeast,
plate 16.

Teacher-made
Pictograph-bar
graph overlay
showing growth
in population in
U.S.

See such pic-
tures on pp.
2, 3, 5, 15,
30, 38, 46, 47
in Borchert and
McGuigan, Geog.

S. Sets up hypotheses.

S. Interprets circle graphs.

4. There has been a migration from rural to urban areas in the last fifty years.

S. Applies previously-learned concepts and generalizations to new data.

G. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, people's skills, etc.

G. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, etc.

D. The location of a city is determined by a variety of factors: natural resources needed for production, power sources, transportation routes to markets, sources of raw materials, etc.

a. Minerals and other resources are unevenly distributed and must be located near sources of power if they are to be used easily if the country is to compete with other countries.

b. Certain kinds of industries are located in particular areas because of agricultural production.

4. There has been a decided shift of population from rural areas to urban areas over the last fifty years.

con-
to
D. The location of industrial centers is affected by a variety of factors such as location of resources needed for production, location of power sources, transportation routes, access to markets, source of labor supply, etc.

a. Minerals and power resources are spread unevenly around the country. Industries must be located where they can obtain them easily if they are to keep their costs low so compete with other firms.

b. Certain kinds of processing industries are located in part because of easy access to agricultural products used in their production.

of heavily populated urban areas as compared to rural areas which are very lightly populated.

89. Say: Not long ago we looked at a chart which showed that the number of farms in the U.S. is declining. What do you think this means about the proportion of people living in rural areas and in cities or urban areas?

Have pupils look at pictographs showing changes in rural-urban population from 1910-1960. (Make graphs for 1910, 1920, 1930, 1940, 1950, and 1960.) Make sure that pupils can read the first graph and then ask them what changes they see in the percentage of the population living in rural areas over the years. What reasons can they think of for this change when climate and topography have not changed? Review what pupils learned in earlier grades about economic changes which might have brought about this movement of people to the urban areas.

90. Show pupils a map of industrial centers of the country and ask: Why do you think these industries are located in these places? What factors would those who build factories consider in deciding where to build a factory? (If pupils have had the Center's fourth grade course review what pupils learned in unit one about factors affecting the location of industry. Otherwise use several of the activities suggested in that unit to develop some understanding of these factors.
91. Make a collection of labels from tin cans and freezer boxes which show where the food was processed. An attractive display could be arranged. Enter the processing companies who sell the goods in your area on a large outline map of the U.S. Count the number

areas as compared to rural areas
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World.

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Review what pupils learned in
changes which might have brought
to the urban areas.

Data for graphs
available in
World Almanac.

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build factories consider in decid-
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on of industry. Otherwise use
uggested in that unit to develop some
s.

Map in Goode's
atlas.
Map in Deasy, et.
al., The World's
Nations.

from tin cans and freezer boxes which
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map of the U.S. Count the number

- G. Power for industry is obtained from the use of coal, oil, natural gas, water, wind, and nuclear energy.
- S. Draws inferences from a comparison of different map patterns of the same area.

- S. Draws inferences from a comparison of different map patterns.

- G. Forests can be used to obtain lumber and other timber products such as paper, turpentine, nuts, etc., depending upon the kinds of trees in the forest.

- c. Other kinds of processing industries grow up close to sources of timber or fishing areas.

of such companies, and have pupils examine the map to notice where the companies are found in relationship to their town or to each other, and to farm areas growing products used. Discuss the pattern of such companies on the map.

92. Project maps of iron, coal, and oil resources, of several other mineral resources, and of railroads and water routes. Have pupils note relationships between resources, transportation routes and centers of industries using the minerals and power. For example, have pupils examine the Birmingham area. Also have pupils examine a map of cities over 100,000 people to see in what parts of the country urban areas are the largest. Are these urban areas all large industrial areas? Also discuss: What are some other sources of power besides coal and oil? Show pictures of water power resources and perhaps of atomic reactor plant.
93. Project a map showing major type of economic activity in different parts of the county. Ask: Why do you think this type of activity is important in this area? (Most of this discussion should be review. However, pupils should analyze reasons for location of lumbering industry and fisheries processing industry in certain areas.) You may also wish to use one or more of the following activities.
- a. Have a committee prepare a bulletin board display on "Industries Which Use Forest Products."
 - b. Have a committee locate and project pictures illustrating various economic activities related to fishing (fishing boats, processing plants, etc.)

Examine the map to notice relationship to their town or growing products used. Discuss the map.

oil resources, of several other roads and water routes. Have pupils discuss, transportation routes and minerals and power. For example, in an area. Also have pupils examine 10 people to see in what parts are largest. Are these urban? Also discuss: What are some uses of oil? Show pictures of an atomic reactor plant.

of economic activity in different areas. Why do you think this type of activity? (Most of this discussion should analyze reasons for development of fisheries processing industry and wish to use one or more of the

bulletin board display on "Industries."

Project pictures illustrating activities related to fishing (fishing boats,

Maps in Goode's atlas.

Deasey et.al., The World's Nations, pp. 89, 123, 117, 29, 55, 83.

Informative Classroom Pictures. Set on South, plate 23 (shows Norris Dam.) Set on the Northeast, plate 30. (Shows cornfields in U.S.)

e.g. Deasey, et.al., The World's Nations, p. 24.

See issues of National Geographic's such as May, 1965, pp. 636 ff.

G. Regions are delimited on many different bases, depending upon the purpose of the study. Some are delimited on the basis of a single phenomenon, some on the basis of multiple phenomena, and some on the basis of functional relationships.

G. A region is an area of one or more homogenous features. The core area is highly homogenous, but there are transitional zones where boundaries are drawn between different regions.

S. Develops a system of regions to fit a particular purpose.

IV. The United States for further study

A. The geographical means of the purpose of study on the basis of the basis of the basis upon his

1. Regions of one factor market

2. Regions of multiple economies

IV. The United States can be divided into regions for further study.

A. The geographer draws regional boundaries as a means of delimiting an area for the purpose of study. He can identify regions on the basis of different factors, depending upon his purpose.

1. Regions may be developed on the basis of one factor such as climate, landforms, market, etc.
2. Regions are often organized on the basis of multi-factors, e.g. landforms, climate, economic activity.

94. Say: We have studied a number of physical and man-made features of our country. However, we have been looking at the country as a whole without studying any one place in great detail. We are going to turn in following units to a study of different regions in our country. Before we do, we need to know what regions mean by regions and how they decide how to divide the country up into regions for further study.

Use one or more of the following activities to help pupils understand the concept of regions and different types of regions that might be developed.

- a. Have students draw individually rough sketch maps of the area of ground on which the school stands and ask them to develop descriptive names for the areas (i.e. area occupied by the school people, parking area, playground, bicycle area, etc.). Keep emphasizing that what they are doing is "regionalizing the immediate area. Point out that while each of these regions has more than one use, they usually have identified the major one. Since larger areas are used variously, identifying a single use is far more difficult.
- b. Review what pupils have learned earlier about some of the patterns they have studied. What did they discover about lines were drawn between different physical features? about areas in which some physical features are found within zones indicated for other features? Discuss the idea of core, transitional zones in a region. Now use the grocery store example suggested in the background paper for this unit. Have a pupil draw a map of a local grocery store from memory. Regionalize this store. Are there any places where some things are found together? Label them transitional zones. Label core areas of regions.

Also see various
sets from Inform-
ative Classroom
Pictures.

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we have been looking at the country
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tures? Discuss the idea of core and
region. Now use the grocery store ex-
background paper for this unit. Have
local grocery store from memory. Re-
Are there any places where some things
bel them transitional zones. Label others

-102-

3. Functional regions are identified to show regions characterized by certain relationships.

- c. Display a land use or zoning map of your city or town. What is the purpose of zoning? Where are the residential areas located? Are the industrial areas contiguous with the class A residential areas? Where are the businesses located? For what is your city noted? What percentage of your city is devoted to this speciality? What percentage to residential areas? Attempt to develop the idea of the great variability in an area.
- d. Examine a land use map of Minnesota. How is most of the land utilized in the southern section of the state? Northern section? Twin Cities area? What is our state's speciality? What "regions" could our state be divided into?
- e. Obtain maps of your own school district and of neighboring school districts and have pupils note the boundary lines. Frequently, they include more than just one community. Help pupils understand how these boundary lines separate functional regions -- divided according to educational services.
- f. Obtain a map of federal reserve districts, locate the main office of the pupils' own district, and show pupils how the boundaries between districts indicate functional divide functional regions.
- g. If pupils live in a large city, it may be possible to obtain from the business office of a large newspaper a map showing the area within which it sells newspapers. Hopefully, data could be obtained to show how the number of papers sold dwindles off in an area where sales of other newspapers picks up.
- h. If pupils live in a small town, have several committees visit local grocery store owners or managers. They should use a map and find out how far in the direction of other towns the stores' customers come. (This may not be possible, but the owner will probably have some idea. If the store is not a chain store and grants credit, the owner is more likely to have this information.) Pupils could then draw in a rough boundary on their map to show the functional region as in-

S. Develops a system of regions to fit a particular purpose.

S. Draws inferences from a comparison of different map patterns of the same area.

B. The United States is divided into a number of different regions on the purposes of the study.

1. Geographers find that the country on the whole is divided into several factors.

2. The United States is divided into the following regions: Northeast, South, West, and Midwest. These regions are defined whether or not the regionalization is homogeneous or not the area is homogeneous or different ways.

to

B. The United States can be divided into regions in a number of different ways, depending upon the purposes of the geographer.

1. Geographers frequently regionalize the country on the basis of a single or just several factors.

2. The United States is sometimes divided into the following multi-factor regions; Northeast, South, Midwest, and West. These regions may be examined to decide whether or not the basis for such regionalization is consistent and whether or not the areas included seem to be homogenous or should be regionalized in different ways.

dictated by grocery store sales of their town as against regions served by other towns.

95. Say: A region, then, is an area on the earth's surface which is different from other areas in one or more ways. Geographers study maps to identify places which are different. They draw possible regional boundaries on the basis of certain factors, and then they study the regions in more detail to find out more about why they differ from other regions.

See maps listed earlier.

Now divide the class into groups and have each group try to regionalize the United States in terms of one criterion such as landforms. Discuss group suggestions, and then have each group regionalize the country on the basis of other criteria such as population; density (including both total population and degree of concentration in large urban centers); growing season; moisture; types of crops and farm animals; major economic activities, etc. Compare the different groups' systems of regionalization on each of these criteria. Ask: Why did you draw your boundaries in these places? Where the systems differ, discuss reasons for differences.

96. Now say that geographers have tried to consider a large number of factors such as these and to divide the country up into regions for further study. If you were going to develop only one system of regions and wanted to indentify major differences you might consider such factors as population, major economic activities, types of agriculture, mining activities, and industrialization. Now let groups try to regionalize the United States using all of these characteristics. Compare their results, letting each group explain its boundary lines. Then show them a system of regions used in one textbook and comapre it with one used in another textbook. Do both texts agree? Why not? Does either text agree with their system of regionalization? Why or why not? help pupils see that different systems of regionaliza-

See maps listed earlier.

- A. IS CURIOUS ABOUT SOCIAL DATA.
- S. Sets up hypotheses.
- S. Draws inferences from a comparison of different map patterns of the same area.
- G. Phenomena are distributed unequally over the earth's surface, resulting in great diversity or variability from one place to another. No two places are exactly alike.
- G. People in most societies of the world depend upon people who live in other communities, regions, and countries for certain goods and services and for markets for their goods.
- S. Uses meridians and parallels to identify directions on maps.
- S. Uses map scales (graphic) to estimate distances.
- S. Interprets map symbols (color layers) in terms of map legend.
- S. Checks hypotheses against data.

tion can be used, and they will study one of them but will come back at the end of their study of the United States to decide if they would prefer to regionalize the country differently.

97. Using Borchert's system of regionalization as a basis, show pupils a series of maps (either regional or U.S.) and focus first upon the Northeast region. Have them examine the maps and hypothesize about what they would see if they were to take a trip from Washington, D.C. to Pittsburgh. Then have them read the description of such a trip in Borchert to check on their hypotheses. Do the same thing with the other regions, having pupils set up hypotheses before reading the description in Borchert. (By having pupils use wall maps and maps in a number of textbooks, you can arrange things so that different groupings need to use the copies of Borchert at different times. Then this activity is possible with only a classroom set of the Borchert textbook.) This activity provides an overview of the diversity of regions and further understanding of the interrelationship of phenomena within each region.

Borchert and McGuigan, Geog. of the New World, pp. 11-40.

G. Phenomena are distributed unequally over the earth's surface, resulting in great diversity or variability from one place to another. No two places are exactly alike.

G. People in most societies of the world depend upon people who live in other communities, regions, and countries for goods and services and for markets for their goods.

S. Draws inferences from pictures.

S. Interprets map symbols.

G. Geographers seek information about areas on the earth's surface which enables them to compare, synthesize, and generalize about these areas.

VII. The geographer studies how places differ and what makes one place different from another; he uses a number of tools of analysis.

A. He is interested in how places differ and in what makes one place different from another.

B. The geographer's basic tool is the map, although he also uses some other tools and techniques.

98. Or view and discuss the film: GEOGRAPHY OF THE UNITED STATES AN INTRODUCTION. This film emphasizes the fact that although each of the regions of the United States is different, it is these differences that help to make our country strong. Provides a good review for seeing the "whole picture."
99. Now have pupils do exercises involving interpretation of coupled pictures of different mountains, different types of grazing lands, different valleys in different climates, and indications of different population densities. These exercises should help pupils interpret map symbols and keep in mind different map patterns in the U.S.

Culminating Activities

100. Divide the class into groups and let each tape its discussion the following questions:
- a. What is a geographer and what does he do? (What is he interested in studying? How does he study it?)
 - b. What are maps and why are they used to present data instead of just describing the data in words? What are some of the limitations of maps?

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film: GEOGRAPHY OF THE UNITED STATES:
film emphasizes the fact that although,
the United States is different, it is
help to make our country strong. Pro-
seeing the "whole picture."

Film: Geography
of the United
States: An In-
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reels, Coronet.

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ferent mountains, different types of
t valleys in different climates, and
t population densities. These exercises
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in the U.S.

Borchert and Mc-
Guigan, Geog. of
the New World,
42-44.

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Several tape re-
corders.

and what does he do? (What is he inter-
How does he study it?)

y are they used to present data instead
he data in words? What are some of the

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1. He examines maps of single features to notice differences and patterns.
2. He compares different patterns of the same place to find possible relationships.
3. He develops systems of regions.
4. He collects data for his maps through field study, aerial photography, etc.

S. Increases the accuracy of his observations through the use of devices to promote reliability such as a questionnaire.

A. IS CURIOUS ABOUT SOCIAL DATA.

101. Ask: How do you think the geographer collects the data needed for his maps? Discuss possible ways, reviewing ways in which they have made simple maps of their own neighborhood. Also remind them of aerial photographs which they have studied and compared with actual maps of an area. How might the photographs be used to make the maps? Show class more maps made from aerial photographs. Then have the class collect data for a type of map not made before. (e.g. A map showing population density in their neighborhood, with information collected by door to door questionnaire about number of people in dwelling. Another map made of single-family dwelling units, duplexes, and apartment houses in the same area. These two maps can be compared for possible relationships.) Now look back at some of the maps pupils have used so far during this year. Let pupils discuss possible ways by which the information on each might have been collected.
102. Perhaps have several pupils give reports on stories of how geographers have collected certain kinds of data, particularly data about natural environments for purposes of making maps. Old issues of National Geographic, etc., should prove useful sources of information for problems facing geographers in mapping parts of the earth.

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S. Tests hypotheses against data.

103. Remind pupils of the hypotheses which they set up early in the unit about the possible effects of the size of the U.S. upon various factors. Show them the list and let them check their hypotheses against the data which they have now studies. Ask: Do you think that size itself was really responsible for some of these things? What other factors were also important.

Alabama	212	116	99	142	48.69	89.45
Arizona	10	7	3,834	5,558	15.13	48.53
Arkansas	182	95	103	173	60.18	109.19
California	137	99	267	372	154.32	353.12
Colorado	46	33	883	1,162	31.93	52.94
Connecticut	16	8	884	107	247.77	444.13
Delaware	7	5	114	146	114.11	235.98
Florida	57	45	290	338	75.23	217.72
Georgia	198	106	130	185	43.28	97.08
Idaho	40	34	328	452	69.82	111.69
Illinois	195	155	159	196	174.15	315.87
Indiana	167	128	118	145	136.90	265.02
Iowa	203	175	169	194	160.71	253.82
Kansas	131	104	370	481	65.80	100.04
Kentucky	218	151	89	113	80.87	135.37
Louisiana	124	74	90	139	82.21	170.63
Maine	30	17	138	178	54.17	83.11

*Source: Department of Commerce, Bureau of Census;
U.S. Census of Agriculture: 1959, Vol. 11.

NUMBER AND ACREAGE OF FARMS*

Farms - Number and Acreage by States 1950 to 1959

Value of Land per Acre 1950 to 1959

STATE	Number of Farms (1,000)		Average Acreage Per Farm		Acreage Value Per Acre (Dollars)	
	1950	1959	1950	1959	1950	1959
United States	5,389	3,711	216	303	64.96	115.08
Alabama	212	116	99	142	48.69	89.45
Arizona	10	7	3,834	5,558	15.13	48.53
Arkansas	182	95	103	173	60.18	109.19
California	137	99	267	372	154.32	353.12
Colorado	46	33	883	1,162	31.93	52.94
Connecticut	16	8	884	107	247.77	444.13
Delaware	7	5	114	146	114.11	235.98
Florida	57	45	290	338	75.23	217.72

STATE	Number of Farms (1,000)		Average Acreage Per Farm		Acreage Value Per Acre (Dollars)	
	1950	1959	1950	1959	1950	1959
Maryland	36	25	112	138	125.07	284.12
Massachusetts	22	11	75	102	189.54	310.14
Michigan	156	112	111	132	98.52	193.15
Minnesota	179	146	184	211	84.46	154.22
Mississippi	251	138	82	135	55.42	105.97
Missouri	230	169	153	197	63.66	112.40
Montana	35	29	1,689	2,213	16.86	34.69
Nebraska	107	90	443	528	57.62	88.66
Nevada	3	2	2,271	4,649	19.24	30.54
New Hampshire	13	7	128	172	72.85	105.90
New Jersey	25	15	70	89	292.84	520.12
New Mexico	24	16	2,014	2,908	15.01	23.46
New York	125	82	128	164	91.62	146.13
North Carolina	289	191	67	83	98.65	185.61
North Dakota	65	55	630	755	28.86	51.63
Ohio	199	140	105	132	136.34	247.11

Montana	35	29	1,689	2,213	16.86	34.69
Nebraska	107	90	443	528	57.62	88.66
Nevada	3	2	2,271	4,649	19.24	30.54
New Hampshire	13	7	128	172	72.85	105.90
New Jersey	25	15	70	89	292.84	520.12
New Mexico	24	16	2,014	2,908	15.01	23.46
New York	125	82	128	164	91.62	146.13
North Carolina	289	191	67	83	98.65	185.61
North Dakota	65	55	630	755	28.86	51.63
Ohio	199	140	105	132	136.34	247.11
Oklahoma	142	95	253	378	51.42	83.86
Oregon	60	43	340	499	59.82	87.42
Pennsylvania	147	100	96	119	107.19	184.65
Rhode Island	3	1	74	99	232.02	379.98
South Carolina	139	78	85	117	69.06	134.01
South Dakota	66	56	674	805	31.30	50.76
Tennessee	232	158	80	102	77.26	130.30
Texas	332	227	439	631	46.21	82.11

STATE	Number of Farms (1,000)		Average Acreage Per Farm		Acreage Value Per Acre (Dollars)	
	1950	1959	1950	1959	1950	1959
Utah	24	18	449	712	43.37	59.50
Vermont	19	12	185	243	55.68	81.49
Virginia	151	98	103	135	82.01	138.60
Washington	70	52	249	363	84.64	131.14
West Virginia	81	44	101	138	59.31	74.27
Wisconsin	169	131	138	161	88.58	132.16
Wyoming	13	10	2,729	3,715	13.21	21.39

Table of Elevations (in feet)

Akron, Ohio	1,200	Hartford, Conn.	58
Albany, N.Y.	20	Indianapolis, Ind.	845
Albuquerque, N.M.	4,950	Jacksonville, Fla.	20
Allentown, Pa.	230	Kansas City, Mo.	1,020
Altoona, Pa.	1,171	Knoxville, Tenn.	890
Amarillo, Tex.	3,678	Lincoln, Neb.	1,189
Ann Arbor, Mich.	820	Little Rock, Ark.	330
Atlanta, Ga.	1,086	Los Angeles, Calif.	5,074
Atlantic City, N.J.	7	Louisville, Ky.	761
Baltimore, Md.	489	Madison, Wisc.	861
Billings, Montana	3,117	Minneapolis, Minn.	980
Birmingham, Ala.	1,060	Nashville, Tenn.	498
Bismark, N.D.	1,670	New Orleans, La.	25
Boston, Mass.	330	New York, N.Y.	575
Buffalo, N.Y.	699	Omaha, Neb.	1,272
Butte, Mont.	5,767	Phoenix, Ariz.	1,160
Charleston, S.C.	10	Portland, Ore.	1,073
Cheyenne, Wyo.	6,060	Sacramento, Calif.	30

Billings, Montana	3,117	Minneapolis, Minn.	980
Birmingham, Ala.	1,060	Nashville, Tenn.	498
Bismark, N.D.	1,670	New Orleans, La.	25
Boston, Mass.	330	New York, N.Y.	575
Buffalo, N.Y.	699	Omaha, Neb.	1,272
Butte, Mont.	5,767	Phoenix, Ariz.	1,160
Charleston, S.C.	10	Portland, Ore.	1,073
Cheyenne, Wyo.	6,060	Sacramento, Calif.	30
Chicago, Ill.	673	St. Louis, Mo.	614
Cleveland, Ohio	1,050	Salt Lake City, Utah	4,390
Dallas, Tex.	686	San Francisco, Calif.	934
Denver, Col.	5,470	Seattle, Wash.	520
Des Moines, Iowa	805	Washington D.C.	410
Detroit, Mich.	672		
Duluth, Minn.	610		
Gary, Ind.	590		

MAKING "GEOGRAPHY GUESSES"

When you were a child you spent much time each day asking your mother many questions. Most of these questions were asking "Why" or "How". For instance you may have asked, "Why is the sky blue, Mother?" or "How do the birds find their way back each year?" And mother, knowing that you must ask questions in order to learn, would do her best to explain the "how" and "why" of your questions. As you grew older and learned how to read, you began to look in books for the answers to your questions. You probably soon discovered that all of your questions could not be answered definitely. You either had to admit that you just couldn't find the answer. Or you had to guess what was the truth from the information you did find.

Let us apply this search for answers to the discovering of information about a city your family plans to visit. Suppose that your home is in St. Paul. Your family wants to take a vacation trip to Seattle, Washington. You were asked by your family to find out what that city is like. Where would you begin to look for information? Perhaps you would try to find someone who had been there and ask him. Or maybe you might check in encyclopedias or other reference books. Where else might you check? Could you use a map? What type of information could it provide? Examine a map of the United States. Make a list of all of the things you could definitely say about Seattle just by studying the map.

There are some things which a map does not tell you definitely. You have to guess about these things. For example one of the guesses you might make about Seattle is that many of the people living there spend their vacations in the mountains. Make a list of "guesses" about Seattle based on your study of the map.

Maps can provide much information about an area if one knows how to read them. But where else might you find information about Seattle? Could you use pictures? Your first task in studying a picture is to identify the things shown in it. The next step would be to describe what is going on in the picture. Finally, you should ask yourself questions about the picture and make guesses about what the items in the

picture reveal about Seattle. For example, suppose you were to look at a picture of Seattle which shows many huge ocean liners from other countries. You could probably say something quite definite about the size of the port of Seattle. You might say that Seattle carries on trade with foreign countries. You might even guess what was being traded or which of the countries Seattle trades with the most. By examining other pictures you might discover what most of the people do for a living, how the people are like us, and how they are different.

By now you should be convinced that you can learn a lot about a place by reading maps, examining references, studying pictures, and asking people who have been there. But did you know that geographers gain much of their information by using the same tools as you did? They do. They also use a few additional tools that you will become familiar with as you study the various regions of the world this year. In fact your main task will be the using of these tools to make "educated guesses" about what an area is really like.

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(Other than wall maps, films and film-
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B. Charts and Models

Geographic Terms Model, A.J. Ny-
strom, Chicago.

Map Symbols and Geographic Terms
Charts, A.J. Nystrom, Chicago.

U.S.G.S. Raised Relief Quadrangles
A.J. Nystrom, Chicago.

C. Map Transparencies

Map transparencies, A.J. Nystrom-
Co., Chicago (Aero-View trans-
parencies).